

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 2089

JUNE 13, 1962

New Species of the Genus *Glyptotermes* Froggatt from the Papuan, Oriental, Ethiopian, and Neotropical Regions (Isoptera, Kalotermitidae)¹

BY KUMAR KRISHNA² AND ALFRED E. EMERSON³

In 1961 Krishna published a generic revision and phylogenetic study of the family Kalotermitidae, in which he regrouped all the described and new living and fossil species into 24 genera. In the present paper the authors describe 20 new species and one new imago caste of the genus *Glyptotermes* from the Papuan, Oriental, Ethiopian, and Neotropical zoogeographical regions. The holotypes, morphotypes, paratypes, and paramorphotypes are deposited in the collection of the American Museum of Natural History in the custody of Dr. Alfred E. Emerson. Duplicate paratypes have been deposited with various institutions around the world. The descriptions, drawings, measurements, and some of the determinations were made by the senior author; the determinations of most of the species were made by the junior author.

¹ Financial assistance for this study was received from the Dr. Wallace C. and Clara A. Abbott Memorial Fund of the University of Chicago and from the National Science Foundation (Grant G-14701). We are indebted to Mr. R. L. Wenzel of the Chicago Natural History Museum for the preparation of some of the preliminary drawings.

² Research Associate, Department of Zoology, the University of Chicago, Chicago, Illinois.

³ Research Associate, Department of Entomology, the American Museum of Natural History, and Professor of Zoology, the University of Chicago, Chicago, Illinois.

The genus *Glyptotermes* is presumably an ancient one and is confined strictly to the tropical regions of the world. In most of the genera of the family Kalotermitidae, except *Glyptotermes*, *Calcaritermes*, *Rugitermes*, *Bifiditermes*, and *Epicalotermes*, the correlation between the distribution of numbers and the place of origin is lost, probably because of the extinction of species in areas where they were once abundant. The distribution of species of *Glyptotermes* is Australian (five), Papuan (eight), Oriental (21), Ethiopian (12, including one new species), Malagasy (two, including one new species), and Neotropical (25). Because of the abundance of species in the Neotropical Region and the decline in numbers in a regular order in the Oriental, Ethiopian, and Malagasy regions on the one hand, and the Oriental, Papuan and Australian regions on the other hand, along the inferred lines of dispersal, Emerson (1955) postulated an origin in the Neotropical Region, with a late Jurassic or early Cretaceous dispersal. This is further corroborated by the fact that the derived genus *Calcaritermes* has the maximum number of species in the Neotropical Region.

The following generic characters are common to the species described in this paper and are therefore not repeated in the species descriptions.

IMAGO: Left mandible with posterior margin of first plus second marginal tooth equal to anterior margin of third marginal tooth; right mandible with posterior margin of second marginal tooth slightly longer than molar plate. Costal margin of wings with a row of minute hairs. Anterior margin of forewing scale almost straight or slightly convex. Subcosta, costa, radius, radial sector, and media veins brown; cubitus unpigmented. Wing membrane with small, pimple-like, pigmented nodules; hairs absent except on costal border. Forewing with all major veins arising independently at wing suture; radius (R_1) short; radial sector heavily sclerotized, running very close and parallel to costal border and without branches; media as heavily sclerotized as radial sector, running very close and parallel to it; cubitus weak and unsclerotized. Tibial spurs 3:3:3. Arolium always present.

Most of the measurements used in this paper are explained by Emerson (1945, p. 438; 1952, p. 482). Some additional measurements are as follows: The width of the head of the soldier is the greatest width between the two lateral margins. The height of the head of the soldier is the greatest distance between the dorsal surface of the head and the ventral surface of the postmentum. The maximum length of the pronotum is the greatest distance between the anterior and the posterior margins lateral but parallel to the median line. The width of the pronotum is the greatest width between the two lateral margins from above without flattening the normal arch.

PAPUAN SPECIES

***Glyptotermes guamensis*, new species**

SOLDIER (FIG. 1): Head pale yellow-brown, frons behind angle of slope yellow, postclypeus and region above antennal sockets brown; labrum yellowish brown; mandibles shiny, dark brown, lighter at bases; antennae dull yellow; pronotum dull yellowish, with brownish patches, margins

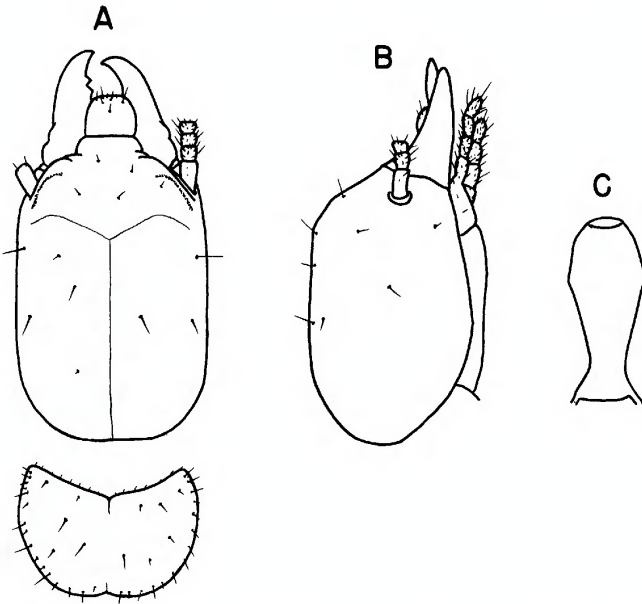


FIG. 1. Holotype soldier of *Glyptotermes guamensis*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

brown; legs and tergites pale yellowish. Head with a few scattered, erect bristles; pronotum with short, erect bristles along margins and on disc; labrum with seven to nine bristles. Head small; sides almost parallel in middle, slightly converging anteriorly; anterodorsal prominences indistinct; frontal slope slightly concave; forehead in profile sloping at an angle of approximately 50 degrees. Mandibles short, outer bases slightly humped, outer margins somewhat sinuate, evenly and convexly curved towards tip; left mandible with three marginal teeth, first and second close to each other, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth, point of first marginal tooth 0.23 mm. from tip of apical tooth.

Postmentum shaped as in figure. Antenna with 11 articles; second longer than third, third subequal to fourth. Pronotum narrower than head; anterior margin emarginate; sides convex; posterior margin slightly indented in middle. Femur slender.

TABLE 1
MEASUREMENTS (IN MILLIMETERS) OF HOLOTYPE SOLDIER OF
Glyptotermes guamensis, NEW SPECIES

Length of head to side base of mandibles	1.35
Width of head	0.98
Height of head	0.86
Length of left mandible	0.60
Maximum width of postmentum	0.38
Minimum width of postmentum	0.15
Length of postmentum	0.90
Median length of pronotum	0.47
Maximum length of pronotum	0.60
Width of pronotum	0.90
Length of hind tibia	0.68

COMPARISONS: *Glyptotermes guamensis* is close to *G. xantholabrum* Hill, but can be distinguished from it in the following respects: the sides of the head are almost parallel, the postmentum is more constricted in the posterior half, and the sides of the pronotum are convex. *Glyptotermes guamensis* differs from *G. lighti*, new species, as follows: the forehead is steeper and slightly concave; the mandibles are shorter and have a slight hump at the outer bases, with the outer margins slightly sinuate; and the pronotum is narrower, with the anterior margin deeply emarginate, the sides convex and narrow posteriorly, and the posterolateral margins rounded.

TYPE LOCALITY: Yigo (latitude 13° 33' N., longitude 144° 53' E.), Guam (type locality), one soldier (holotype), nymphs, collected by O. H. Swezey, October 18, 1936, "in log of fertile breadfruit."

***Glyptotermes lighti*, new species**

IMAGO (FIG. 2): Head dark smoky brown, lighter anteriorly; labrum yellowish brown; antennae light smoky brown; pronotum same color as anterior region of head; femur light smoky brown; tibia whitish; tergites light brown to dark brown; wing membrane light smoky brown, wing scale darker. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head shaped as in figure. Y suture visible. Eyes small, shaped as in figure. Ocellus small,

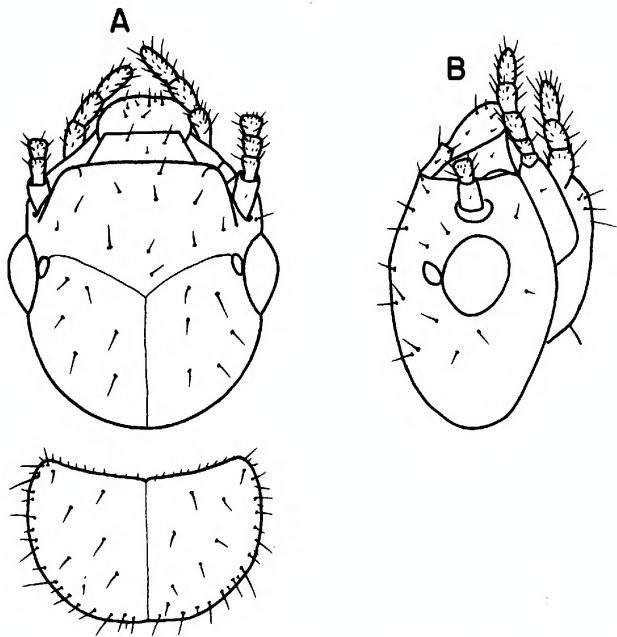


FIG. 2. Imago of *Glyptotermes lighti*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

TABLE 2
MEASUREMENTS (IN MILLIMETERS) OF IMAGOS OF *Glyptotermes lighti*, NEW SPECIES

	Type and Paratype Colonies		Paratype from Chagos	
	No.	Range	No.	Range
Length of head to tip of labrum	10	0.99-1.13	2	1.01
Length of head to side base of mandibles	10	0.83-0.90	2	0.83-0.84
Width of head	10	0.90-0.98	2	0.94
Diameter of eye	10	0.25-0.29	2	0.25
Eye from lower margin	10	0.11-0.14	2	0.11
Length of ocellus	10	0.09-0.11	2	0.07
Median length of pronotum	10	0.45-0.53	2	0.48-0.53
Maximum length of pronotum	10	0.56-0.60	2	0.53-0.60
Width of pronotum	10	0.83-0.88	2	0.75
Length of hind tibia	10	0.79-0.81	2	0.83
Length of forewing from suture	10	4.95-5.37	2	—
Width of forewing	10	1.39-1.50	2	—

oval, oblique, touching eye. Antenna with 11 to 12 articles; second longer than third or fourth, third variable, shorter or longer than fourth. Pronotum slightly narrower than head; anterior margin concave; posterolateral margins broadly rounded; posterior margin straight. Hind wing with media branching from radial sector, outside wing scale, at about 1.20 mm. from suture.

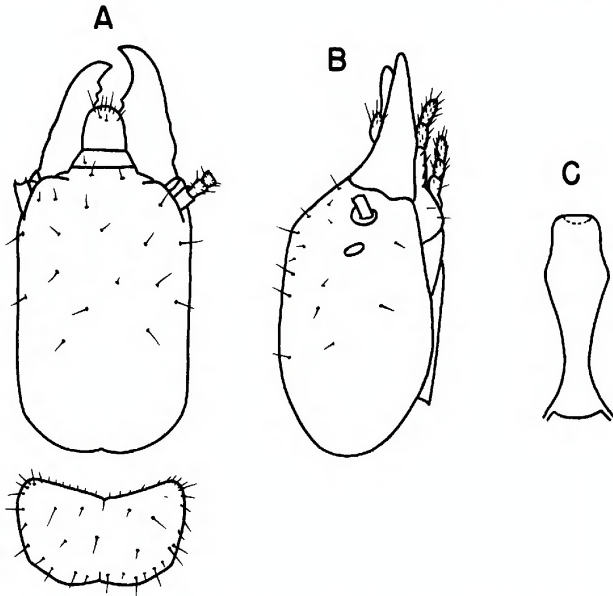


FIG. 3. Soldier of *Glyptotermes lighti*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony.

COMPARISONS: In *Glyptotermes palauensis*, new species, the eye is a different shape (fig. 5), the ocellus is not so oblique, the wings are narrower and shorter, and the posterolateral margins of the pronotum are not so broadly rounded. *Glyptotermes xantholabrum* Hill is reported to be variable in size. The imago of the type series from Samoa differs from *G. lighti* as follows: the head, pronotum, and wings are shorter and narrower; the posterolateral margins of the pronotum are more broadly rounded, and its posterior margin is straight; and the eyes are smaller and shaped differently.

SOLDIER (FIG. 3): Head medially light brown, lateral and posterior region yellowish brown, behind angle of slope yellowish, frons light brown; labrum light yellow; mandibles brown, lighter at bases; antennae and

legs pale yellow; pronotum pale yellowish brown, margins brown; tergites pale yellowish. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head with sides parallel; posterior margin indented in middle; anterodorsal prominences indistinct; frons in middle slightly depressed; forehead in profile sloping at an angle of approximately 40–45 degrees. Labrum with anterior margin broadly rounded. Mandibles short, outer margins slightly indented in middle; left mandible with three marginal teeth, first and second close to each other, forming an acute angle, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth, first larger, second very small, in some specimens indistinct, point of first marginal tooth 0.30 mm. from tip of apical tooth. Postmentum shaped as in figure; broadest at anterior third, constricted posteriorly, nearly twice as wide in broadest part as in narrowest. Antenna with 10 to 11 articles; second longer than third or fourth, third longer or shorter than fourth. Pronotum shape and size variable; anterior margin angular, emarginate; anterolateral corners rounded; sides rounded, in some specimens straight; posterolateral margins straight or concave; posterior margin slightly emarginate. Femur slender.

TABLE 3
MEASUREMENTS (IN MILLIMETERS) OF SOLDIERS OF *Glyptotermes lighti*, NEW SPECIES

	Holotype	Type and Paratype		Paratype from Chagos No.	
		No.	Colonies Range		
Length of head to side base of mandibles	1.58	16	1.12–1.58	1	1.43
Width of head	1.02	16	0.88–1.05	1	0.98
Height of head	0.90	16	0.75–0.90	1	0.90
Length of left mandible	0.75	16	0.68–0.75	1	0.71
Maximum width of postmentum	0.36	16	0.32–0.38	1	0.36
Minimum width of postmentum	0.15	16	0.15–0.19	1	0.15
Length of postmentum	1.13	16	0.69–1.13	1	1.05
Median length of pronotum	0.51	16	0.41–0.54	1	0.47
Maximum length of pronotum	0.60	16	0.53–0.69	1	0.53
Width of pronotum	0.98	16	0.75–1.14	1	0.83
Length of hind tibia	0.68	16	0.53–0.71	1	0.68

COMPARISONS: *Glyptotermes lighti* closely resembles *G. schmidtii*, new species, and *G. palauensis*, new species. In *Glyptotermes schmidtii* the head is smaller, the forehead is steeper, the mandibles are shorter, with their outer bases distinctly humped, and the postmentum is less constricted.

Glyptotermes palauensis is variable in size and differs from *G. lighti* as follows: the forehead is steeper, the posterior margin of the head is not indented in the middle, and the anterior margin of the pronotum is more deeply emarginate. In *Glyptotermes taveuniensis* Hill the head is longer and broader, the mandibles are longer, the postmentum is longer and more strongly constricted, and the posterolateral margins of the pronotum are rounded.

TYPE LOCALITY AND DISTRIBUTION: Ine Island, Arno Atoll (approximate latitude $7^{\circ} 05' N.$, longitude $171^{\circ} 42' E.$), Marshall Islands (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), nymphs, collected by J. T. Marshall, July 18, 1950, no. T-644, in dry, sound wood of coconut stump 12 feet tall; imagoes (paramorphotypes), soldiers (paratypes), collected by J. T. Marshall, June 30, 1950, no. T-639, in hard part of standing dead coconut, dry moldy wood; dealates (paramorphotypes), collected by J. T. Marshall, June 20, 1950, no. T-634, in breadfruit branch on ground. United States Navy Base, Rita Island, Majuro Atoll (approximate latitude $7^{\circ} 10' N.$, longitude $171^{\circ} 13' E.$), Marshall Islands, soldiers (paratypes), nymphs, collected by J. T. Marshall, September 6, 1950, no. CT-631, in coconut log, hard dry parts. Chagos, Solomon Islands, dealates, one soldier (paratype), collected by T. S. Gardiner.

The species is named in honor of the late S. F. Light, Professor of Zoology, University of California, Berkeley, California.

***Glyptotermes nissanensis*, new species**

SOLDIER (FIG. 4): Freshly molted soldier. Head yellow, posteriorly pale yellow, frontal area with a brownish tinge; labrum yellow; mandibles light brown, yellowish at bases; pronotum pale yellow; antennae, legs, and tergites whitish, with a tinge of yellow. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head long and narrow, broader posteriorly; anterodorsal prominences indistinct, surface rough; frons in middle slightly depressed; forehead in profile sloping at an angle of approximately 60 degrees. Eyes small, oval. Labrum reaching tip of first left marginal tooth; anterior margin convex. Mandibles short, outer bases slightly humped; left mandible with three marginal teeth, first and second close to each other, third far removed with a broad base, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth, second very faint, point of first marginal tooth 0.30 mm. from tip of apical tooth. Postmentum long; anterior margin

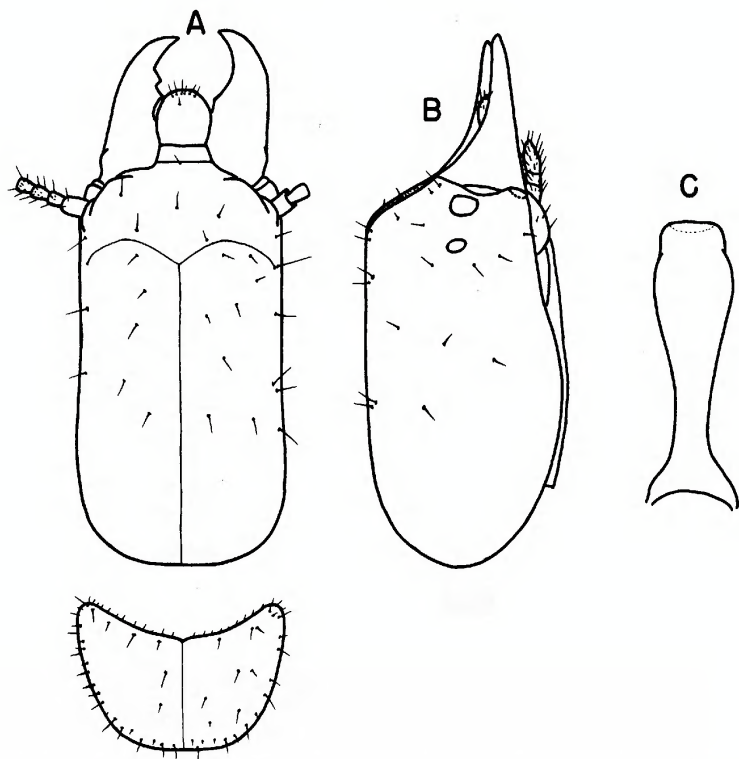


FIG. 4. Holotype soldier of *Glyptotermes nissanensis*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

straight; constricted in proximal third, slightly more than twice as wide

TABLE 4
MEASUREMENTS (IN MILLIMETERS) OF HOLOTYPE SOLDIER OF
Glyptotermes nissanensis, NEW SPECIES

Length of head to side base of mandibles	1.65
Width of head	0.98
Height of head	0.84
Length of left mandible	0.71
Maximum width of postmentum	0.36
Minimum width of postmentum	0.15
Length of postmentum	1.20
Median length of pronotum	0.45
Maximum length of pronotum	0.60
Width of pronotum	0.98
Length of hind tibia	0.69

in broadest part as in narrowest. Antenna with 11 articles; second article equal to third, third equal to fourth. Pronotum as broad as head; anterior margin angular, deeply emarginate; anterolateral corners narrow; sides converging posteriorly; posterior margin almost straight. Femur slender.

COMPARISONS: *Glyptotermes nissanensis* closely resembles *G. palauensis*, new species, but differs in having a steeper forehead, narrower head, narrower anterolateral corners of the pronotum, and the anterior margin of the labrum not pointed medially. In *Glyptotermes taveuniensis* Hill the head is larger, the forehead is not so steep, the postmentum is longer, and the pronotum is larger, with broader anterolateral corners and more broadly rounded posterolateral margins. In *Glyptotermes schmidtii*, new species, the head is shorter, the forehead is not so steep, the anterior margin of the pronotum is not so deeply emarginate, the sides of the pronotum are almost parallel, and the posterolateral margins of the pronotum are straight and slope at an angle before joining the posterior margin. In *Glyptotermes lighti*, new species, the head is shorter and broader, the forehead is not so steep, and the pronotum is broader, with its anterolateral corners broader and its posterolateral margin either straight or concave.

TYPE LOCALITY: Nissan Island (latitude $4^{\circ} 30' S.$, longitude $154^{\circ} 20' E.$), Green Islands (type locality), one soldier (holotype), nymphs, collected by L. J. Dumbleton, no. 11, from rotten log.

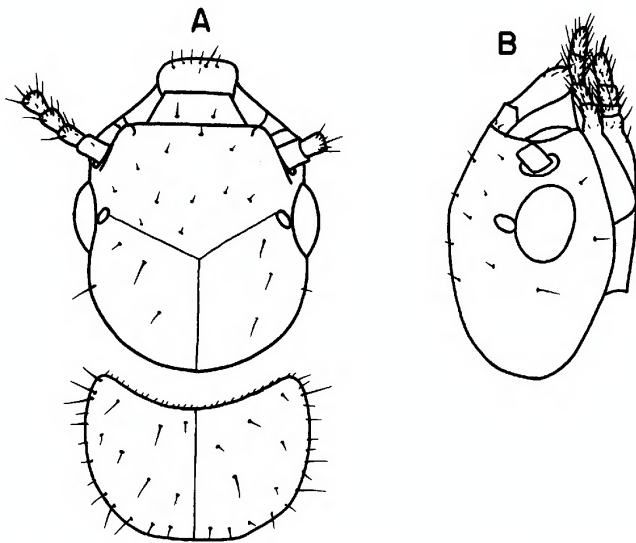


FIG. 5. Imago of *Glyptotermes palauensis*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

***Glyptotermes palauensis*, new species**

IMAGO (FIG. 5): Head rusty brown; pronotum dark rusty brown, darker than head; labrum yellow-brown; antennae smoky brown; femur brown; tibia whitish; tergites brown; wings smoky brown; wing scale lighter than pronotum. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head with Y suture present but not clearly visible. Eyes small, shaped as in figure. Ocellus oval, touching the eye. Antenna with 11 to 12 articles; second article subequal to third, third longer than fourth. Pronotum narrower than head; anterior margin concave; sides converging into straight posterior margin. Hind wing with media branching from radial sector, outside wing scale, at about 0.98 mm. from suture.

TABLE 5
MEASUREMENTS (IN MILLIMETERS) OF IMAGOS OF *Glyptotermes palauensis*, NEW SPECIES

	Type and Paratype Colonies from Palau Islands		Paratype Colonies from Ponape Island	
	No.	Range	No.	Range
Length of head to tip of labrum	20	0.98-1.20	4	1.05-1.13
Length of head to side base of mandibles	20	0.83-0.90	4	0.83-0.90
Width of head	20	0.84-0.98	4	0.86-0.92
Diameter of eye	20	0.25-0.29	4	0.25-0.29
Eye from lower margin	20	0.09-0.13	4	0.09-0.11
Length of ocellus	20	0.07-0.09	4	0.07
Median length of pronotum	20	0.41-0.53	4	0.45-0.49
Maximum length of pronotum	20	0.50-0.60	4	0.53-0.56
Width of pronotum	20	0.68-0.88	4	0.73-0.86
Length of hind tibia	20	0.68-0.83	4	0.68-0.75
Length of forewing from suture	20	4.05-5.29	—	—
Width of forewing	20	1.07-1.35	—	—

COMPARISONS: *Glyptotermes palauensis* is distinguishable from *G. lighti*, new species, in having a differently shaped eye, narrower and shorter wings, and the posterolateral corners of the pronotum not so broadly rounded. In *G. taveuniensis* Hill the head is broader, the eyes are larger and shaped differently, and the wings are longer and broader.

SOLDIER (FIG. 6): Head yellow-brown, lighter posteriorly, frons slightly darker; labrum yellowish; mandibles light reddish brown at bases, blackish at tips; antennae pale yellow-brown; pronotum brownish yellow; tergites and legs pale yellowish brown. Head with a few scat-

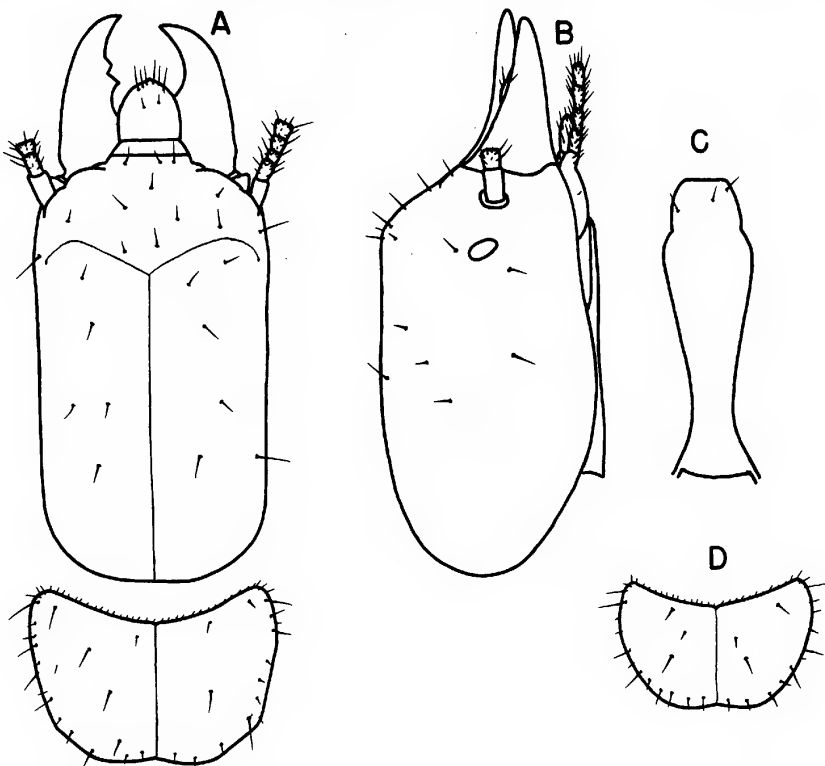


FIG. 6. Soldier of *Glyptotermes palauensis*, new species. A. Head and pronotum of holotype from above. B. Head of holotype from side. C. Postmentum of holotype from below. D. Pronotum from above of paratype from Awakpa Uh District, Ponape Island, Carolines.

tered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head variable in size; sides parallel; anterodorsal prominences indistinct; frons in middle very slightly depressed; forehead in profile sloping at an angle of approximately 50 degrees. Y suture present but not visible. Eyes small, oval. Labrum with anterior margin pointed medially. Mandibles short, outer margins evenly curved; left mandible with three marginal teeth, first and second close to each other, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth, second vestigial, point of first marginal tooth 0.34 mm. from tip of apical tooth. Postmentum long, anterior margin straight; narrowest in posterior third; sides from broadest portion converging anteriorly. Antenna with nine to 11 articles; second article longer than fourth, third variable. Pronotum as

broad as or broader than head; shape and size variable (fig. 6A, D); anterior margin deeply emarginate; anterolateral corners broad and rounded; in type colony posterolateral margins concave or sinuate, in paratype colonies concave or broadly rounded; posterior margin slightly indented in middle. Hind femur slightly swollen.

TABLE 6
MEASUREMENTS (IN MILLIMETERS) OF SOLDIERS OF *Glyptotermes palauensis*, NEW SPECIES

	Holotype	Type and Paratype Colonies from Palau Islands		Paratype Colonies from Ponape Island	
		No.	Range	No.	Range
Length of head to side base of mandibles	1.88	20	1.20-1.95	5	1.28-1.73
Width of head	1.09	20	0.83-1.13	5	0.90-1.05
Height of head	1.01	20	0.75-1.05	5	0.83-0.94
Length of left mandible	0.75	20	0.60-0.79	5	0.60-0.73
Maximum width of postmentum	0.43	20	0.32-0.45	5	0.32-0.38
Minimum width of postmentum	0.21	20	0.15-0.23	5	0.15-0.17
Length of postmentum	1.35	20	0.75-1.43	5	0.75-1.20
Median length of pronotum	0.60	20	0.34-0.68	5	0.34-0.53
Maximum length of pronotum	0.83	20	0.45-0.86	5	0.45-0.68
Width of pronotum	1.13	20	0.75-1.20	5	0.75-0.98
Length of hind tibia	0.83	20	0.49-0.84	5	0.56-0.75

COMPARISONS: The soldier of *Glyptotermes palauensis* is variable in size, and the shape of the pronotum also varies. It closely resembles *G. nissanensis*, new species, but differs in its less steep forehead and in the fact that the anterior margin of the labrum is pointed medially. In *G. lighti*, new species, the forehead is less steep, the posterior margin of the head is indented in the middle, and the anterior margin of the pronotum is not so deeply emarginate.

TYPE LOCALITY AND DISTRIBUTION: Koror Island (latitude 7° 20' N., longitude 134° 30' E.), limestone ridge south of inlet, Palau Islands (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), nymphs, collected by H. S. Dybas, January 21, 1948, in palm log; imagoes (paramorphotypes), soldiers (paratypes), collected by H. S. Dybas, February 10, 1948, in palm stump; one soldier (paratype), nymphs, collected by H. S. Dybas, January 18, 1948, in palm log; three colonies, dealates (paramorphotypes), collected by H. S. Dybas, November 18, 1947, January 17 and 21, 1948, respectively; one imago (paramorphotype), collected by H. S. Dybas, November 19, 1947.

Ngiwall (latitude $7^{\circ} 33' N.$, longitude $134^{\circ} 38' E.$), Babelthuap Island, Palau Islands, one soldier (paratype), nymph, collected by J. L. Gressitt, August 14, 1951, in dead coconut log. Ulimang (latitude $7^{\circ} 37' N.$, longitude $134^{\circ} 37' E.$), Babelthuap Island, Palau Islands, imagoes (paramorphotypes), collected by H. S. Dybas, December 26, 1947. Airai (latitude $7^{\circ} 21' N.$, longitude $134^{\circ} 34' E.$), Babelthuap Island, Palau Islands, one imago (paramorphotype), collected by J. L. Gressitt, October 1, 1951. Aurapushekaru Island (latitude $7^{\circ} 18' N.$, longitude $134^{\circ} 30' E.$), Palau Islands, imagoes (paramorphotypes), soldiers (paratypes), collected by H. S. Dybas, January 14, 1948, in old palm log. Kayangel Atoll (approximate latitude $8^{\circ} 04' N.$, longitude $134^{\circ} 43' E.$), Palau Islands, one imago (paramorphotype), one soldier (paratype), collected by J. L. Gressitt, September 16, 1951, in coconut. Palau Islands, one imago (paramorphotype), collected by H. S. Dybas, January, 1948. Peleliu Island (latitude $7^{\circ} 00' N.$, longitude $134^{\circ} 14' E.$), Palau Islands, imagoes (paramorphotypes), one soldier (paratype), nymphs, collected by H. S. Dybas, August 4, 1945, no. 2432, in rotten log. Awakpa, Uh District, Ponape Island, Carolines, king, queen (paramorphotypes), soldiers (paratypes), collected by H. S. Dybas, March 2, 1948, in banyan log. Mt. Tamatamansakir (latitude $6^{\circ} 55' N.$, longitude $158^{\circ} 11' E.$), Ponape Island, Carolines, approximately 500–1000 feet, dealates (paramorphotypes), collected by H. S. Dybas, February 29, 1948, under bark. Summit of Mt. Kupuriso, Ponape Island, Carolines, approximately 2000 feet, dealates (paramorphotypes), collected by H. S. Dybas, March 10, 1948, under bark.

***Glyptotermes schmidti*, new species**

SOLDIER (FIG. 7): Head brown, region near clypeo-frontal suture and around antennal sockets reddish brown; mandibles reddish brown, shiny; pronotum light brown, lighter than head, dark spots on disc; antennae, legs, and tergites light brown. Head sparsely covered with erect bristles; pronotum with both long and short bristles along margins and on disc. Head short; sides parallel; anterodorsal prominences indistinct; forehead in profile sloping at an angle of approximately 45 degrees. Eyes small, oval. Mandibles short, outer bases distinctly humped; left mandible with three faint marginal teeth, first and second close to each other, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth (tip broken in holotype specimen). Postmentum short; not strongly constricted in middle. Antenna with 11 articles; second longer than third or fourth, third shorter

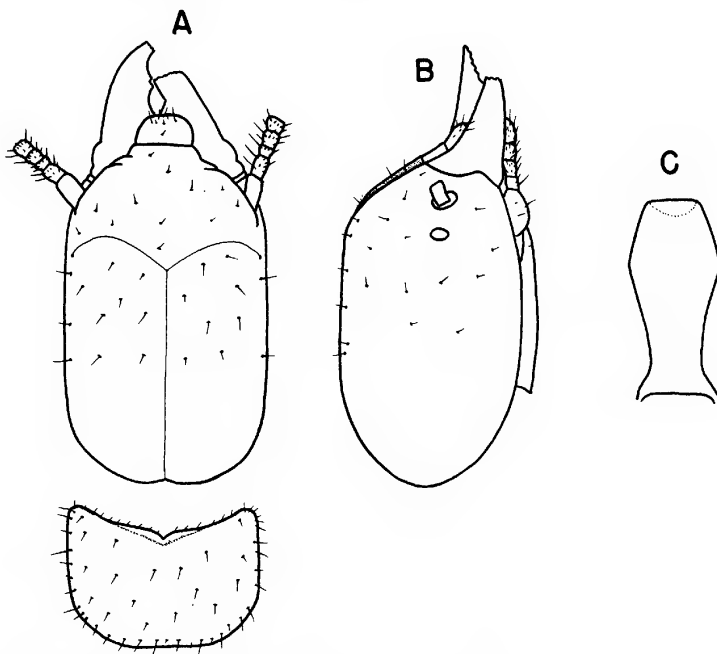


FIG. 7. Holotype soldier of *Glyptotermes schmidtii*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

than fourth. Pronotum slightly narrower than head; anterior margin angular; sides parallel; posterolateral margin almost straight, sloping at an angle to meet the straight posterior margin. Femur slender.

TABLE 7
MEASUREMENTS (IN MILLIMETERS) OF HOLOTYPE SOLDIER OF
Glyptotermes schmidtii, NEW SPECIES

Length of head to side base of mandibles	1.35
Width of head	0.98
Height of head	0.90
Length of left mandible	0.64
Maximum width of postmentum	0.39
Minimum width of postmentum	0.23
Length of postmentum	0.83
Median length of pronotum	0.49
Maximum length of pronotum	0.54
Width of pronotum	0.94
Length of hind tibia	0.68

COMPARISONS: *Glyptotermes schmidtii* is distinguishable from *G. palauensis*, new species, in its having a much more prominent and distinct hump in the outer base of the mandible, and the postmentum not so strongly constricted in the middle, and in being different in shape. In *Glyptotermes nissanensis*, new species, the head is longer, the forehead is steeper, the postmentum is longer, and the pronotum has its anterior margin deeply emarginate and its posterolateral margins rounded. In *G. taveuniensis* Hill the head is longer, the hump in the outer base of the mandible is indistinct, the postmentum is longer, and the pronotum is broader, with its posterolateral margins evenly rounded. In *G. lighti*, new species, the mandibles are shorter, the hump in the outer base of the mandible is indistinct, the postmentum is more strongly constricted, and the posterior margin of the pronotum is emarginate.

TYPE LOCALITY: Hog Harbor (latitude $15^{\circ} 15' S.$, longitude $167^{\circ} 0' E.$), Espiritu Santo Island, New Hebrides (type locality), one soldier (holotype), nymphs, collected by K. P. Schmidt, April 5, 1929, Crane Pacific Expedition.

The species is named in honor of the late Dr. K. P. Schmidt, Chief Curator of Zoology, Chicago Natural History Museum, Chicago, Illinois.

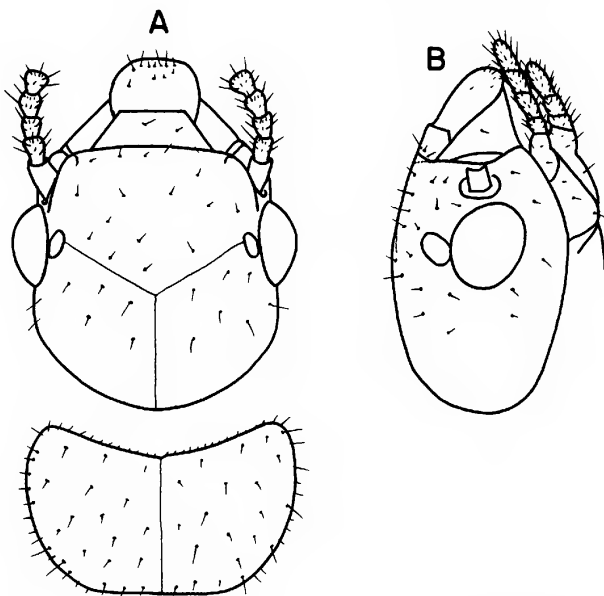


FIG. 8. Morphotype queen of *Glyptotermes concavifrons*, new species. A. Head and pronotum from above. B. Head from side.

ORIENTAL SPECIES

Glyptotermes concavifrons, new species

Glyptotermes sp. nov. KIRBY, 1941, pp. 33, 66 (Protozoa).
Glyptotermes sp. nov. KIRBY, 1942b, p. 191 (Protozoa).
Glyptotermes sp. KALSHOVEN, 1960, p. 36 (distribution).

DEALATE IMAGO (FIG. 8): Head yellow-brown; corners of postclypeus reddish brown; anteclypeus pale yellow; labrum brownish yellow; pronotum almost same color as posterior region of head; antennae yellowish brown; legs yellowish; tergites light yellow-brown; sternites yellow; wing scale smoky brown. Head with a few scattered, erect bristles. Pronotum with both long and short bristles along margins and on disc. Head with sides posterior to eyes parallel for a short distance, posteriorly broadly convex. Y suture faintly visible. Eyes large, shaped as in figure. Ocellus large, oblique, touching the eye. Labrum with anterior margin straight. Antenna broken; second article slightly longer than third, third equal to fourth. Pronotum almost as broad as head; anterior margin concave; sides rounded; posterolateral margins rounded; posterior margin straight.

TABLE 8
MEASUREMENTS (IN MILLIMETERS) OF A SINGLE MORPHOTYPE FEMALE DEALATE IMAGO OF
Glyptotermes concavifrons, NEW SPECIES

Length of head to tip of labrum	1.50
Length of head to side base of mandibles	1.13
Width of head	1.24
Diameter of eye	0.37
Eye from lower margin	0.17
Length of ocellus	0.18
Median length of pronotum	0.60
Maximum length of pronotum	0.73
Width of pronotum	1.20
Length of hind tibia	1.11
Length of forewing scale	0.99
Width of forewing scale	0.68

COMPARISONS: *Glyptotermes dilatatus* (Bugnion and Popoff) resembles *G. concavifrons*, but differs from it in the following respects: the eyes are larger and of a different shape, and the pronotum is longer and broader, with its anterolateral corners more broadly rounded. *Glyptotermes kirbyi*, new species, has larger eyes, which are of a different shape, and its pronotum has broader anterolateral corners and almost straight postero-lateral margins. *Glyptotermes caudomunitus* Kemner and *G. niger* Kemner

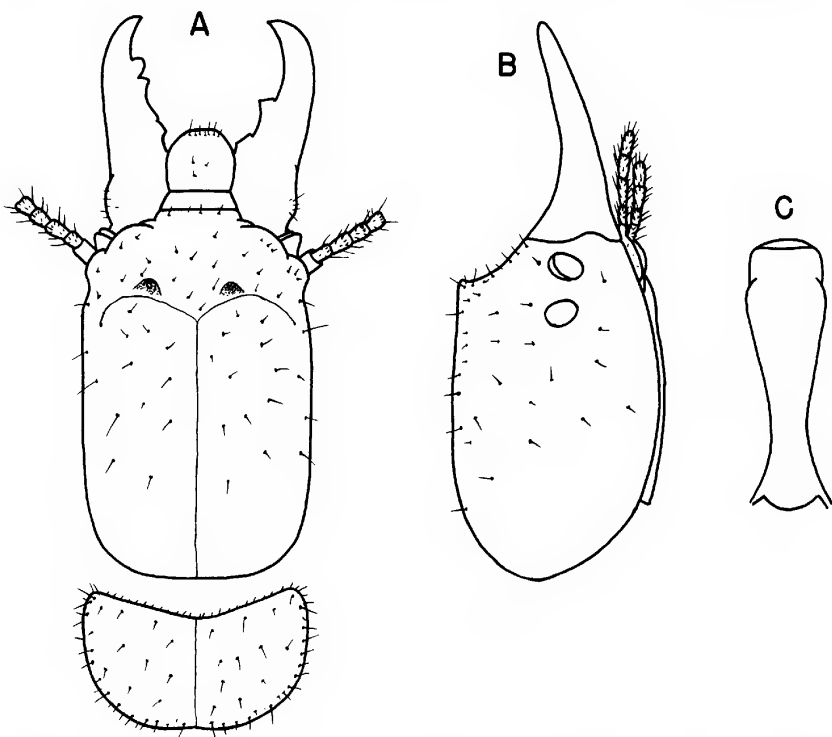


FIG. 9. Holotype soldier of *Glyptotermes concavifrons*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

are smaller, and *G. montanus* Kemner is larger, in all respects.

SOLDIER (FIG. 9): Head yellowish brown, lighter posteriorly, around antennal sockets and postclypeal region reddish brown; antennae brownish yellow; labrum light brown; mandibles shiny, blackish, brownish at bases; pronotum pale brownish yellow; tergites and legs pale brownish yellow. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc; outer bases of mandibles with minute hairs. Head elongate; sides parallel; anterodorsal prominences distinct, small, pimple-like tubercle at tip of each prominence; in profile frons concave. Eyes large, suboval. Labrum slightly wider than long, anterolateral corners rounded. Mandibles long, outer bases humped; left mandible with three marginal teeth, first small, subconical, second with posterior margin concave, third small; right mandible with two marginal teeth, point of first marginal tooth 0.45 mm. from tip of apical tooth. Postmentum long; shaped as in figure. Antenna with 11 to 13 articles; second equal to fourth; third variable, longer or shorter than

fourth. Pronotum as broad as or slightly broader than head; anterior margin broadly concave; posterolateral margins broadly rounded, in some specimens straight and sloping at an angle; posterior margin very faintly emarginate. Femur slender.

TABLE 9
MEASUREMENTS (IN MILLIMETERS) OF FOURTEEN SOLDIERS OF
Glyptotermes concavifrons, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.95	1.84–2.18	2.00
Width of head	1.31	1.28–1.35	1.34
Height of head	1.20	1.16–1.28	1.21
Length of left mandible	1.20	1.09–1.20	1.16
Maximum width of postmentum	0.45	0.41–0.49	0.45
Minimum width of postmentum	0.26	0.23–0.30	0.26
Length of postmentum	1.50	1.35–1.59	1.48
Median length of pronotum	0.66	0.60–0.75	0.66
Maximum length of pronotum	0.81	0.77–0.98	0.83
Width of pronotum	1.31	1.24–1.40	1.32
Length of hind tibia	1.01	0.98–1.05	1.01

COMPARISONS: *Glyptotermes concavifrons* closely resembles *G. dilatatus* (Bugnion and Popoff), but differs as follows: the postmentum is less constricted in the middle, and the anterolateral corners of the pronotum are less broadly rounded. In *Glyptotermes brevicaudatus* (Haviland) the head is longer and narrower, the anterodorsal prominences on the forehead are blunt and not so prominent, the mandibles are shorter, and the pronotum is longer and narrower. In *G. borneensis* (Haviland) the head is larger and thicker, the anterodorsal prominences on the forehead are blunt, the mandibles are shorter, and the pronotum is broader. *Glyptotermes caudomunitus* Kemner and *G. niger* Kemner are smaller in all respects. In *Glyptotermes montanus* Kemner the head is larger and thicker, the anterodorsal prominences on the forehead are blunt, the forehead slope is steeper, the mandibles are shorter, the posterior margin of the second left marginal tooth is straight, and the pronotum is longer and broader.

TYPE LOCALITY AND DISTRIBUTION: Bandjar (latitude 7° 21' S., longitude 10° 39' E.), Sengkong VII, West Java (type locality), dealate imago (morphotype), soldiers (holotype and paratypes), nymphs, collected by H. Kirby, no. T-4567, June 17, 1935; soldiers (paratypes), nymphs, collected by H. Kirby, no. T-4571, June 15, 1935. Bandjar, East Prenagar Residency, elevation 50 meters, West Java, soldiers (paratypes), nymphs, collected by H. Kirby, no. T-4559, June, 1935.

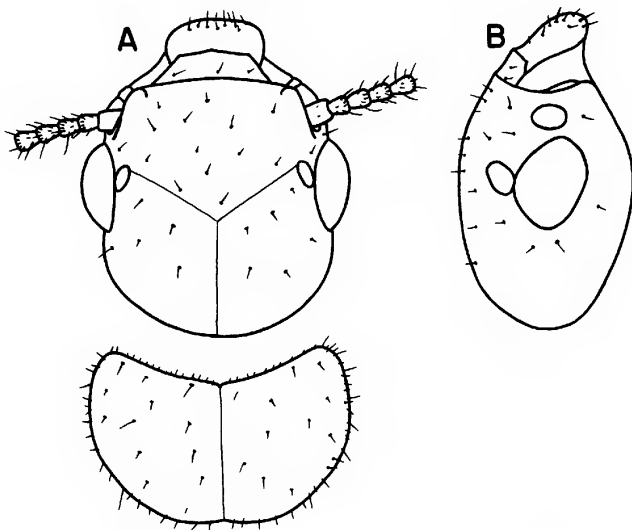


FIG. 10. Imago of *Glyptotermes kirbyi*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from morphotype colony.

***Glyptotermes kirbyi*, new species**

Glyptotermes sp. nov. KIRBY, 1941, p. 39 (Protozoa).

Glyptotermes sp. KIRBY, 1942b, p. 191 (Protozoa).

Glyptotermes sp. KALSHOVEN, 1960, p. 36 (distribution).

IMAGO (FIG. 10): Head brownish yellow posteriorly, yellowish in middle; postclypeus reddish brown; labrum yellow; antennae brownish; pronotum yellow, with margins darker in color; legs pale yellow; tergites yellow, with a brownish tinge; wing scale pale yellowish brown; head sparsely covered with a few short bristles; pronotum with both long and short bristles along margins and on disc. Head wider than length to side base of mandibles; outline of head behind eyes almost semicircular. Y suture faintly visible. Eyes large, shaped as in figure. Ocellus large, oval, touching the eye. Antenna with 13 to 15 articles; second longer or equal to third, fourth shorter than second or third. Pronotum slightly narrower than head; anterior margin concave; posterolateral margin sloping at an angle; posterior margin very slightly emarginate. Hind wing with media branching from radial sector, outside wing scale, at about 1.20–1.35 mm. from suture.

COMPARISONS: *Glyptotermes kirbyi* closely resembles *G. dilatatus* (Bugnion and Popoff), but differs from it in having a narrower head, larger ocellus, differently shaped eye, broader pronotum, narrower anterolateral corners

TABLE 10
MEASUREMENTS (IN MILLIMETERS) OF NINE IMAGOE OF *Glyptotermes kirbyi*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.31-1.50	1.39
Length of head to side base of mandibles	1.05-1.13	1.09
Width of head	1.20-1.24	1.21
Diameter of eye	0.39-0.43	0.41
Eye from lower margin	0.13-0.14	0.13
Length of ocellus	0.14-0.18	0.16
Median length of pronotum	0.64-0.68	0.64
Maximum length of pronotum	0.75-0.79	0.76
Width of pronotum	1.13-1.16	1.16
Length of hind tibia	0.90-0.92	0.90
Length of forewing from suture	6.79-7.21	6.98
Width of forewing	1.91-1.99	1.94

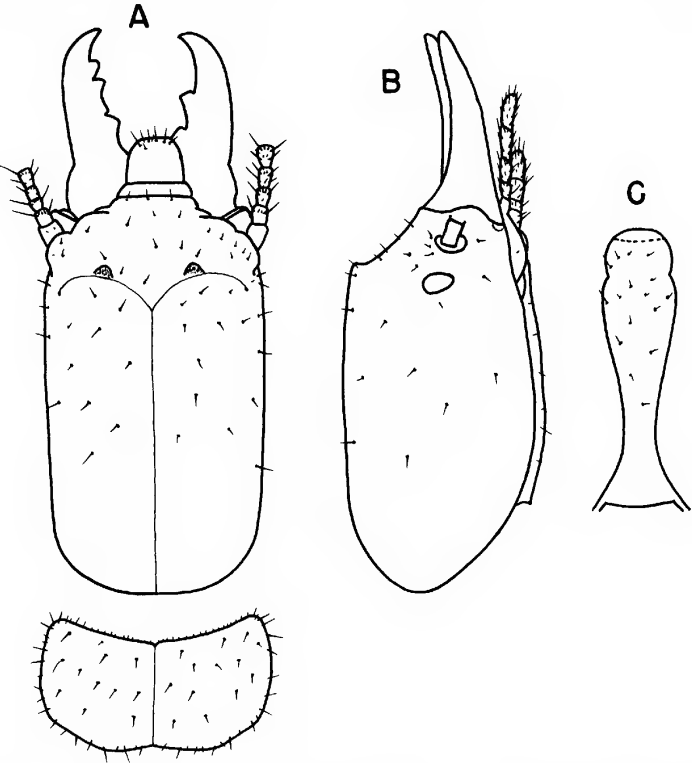


FIG. 11. Holotype soldier of *Glyptotermes kirbyi*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

of the pronotum, and narrower wings. In *Glyptotermes concavifrons*, new species, the eye is smaller and differently shaped, and the posterolateral margins of the pronotum are rounded. *Glyptotermes brevicaudatus* (Haviland) is smaller, and *G. buttel-reepeni* Holmgren larger, in all measurements.

SOLDIER (FIG. 11): Head yellowish brown, frons slightly darker; labrum yellowish; mandibles blackish at tips, in middle reddish brown, slightly yellowish at bases; pronotum yellow, with light brown patches; legs and tergites pale yellowish. Head with a few scattered, erect bristles; pronotum with both long and short, erect bristles along margins and on disc. Head elongate, slightly narrower posteriorly; anterodorsal prominences distinct, pointed; frons depressed and concave. Eyes large, suboval. Labrum with anterior margin straight. Mandibles long, outer bases humped; left mandible with three marginal teeth, first subconical, second with posterior margin concave; right mandible with two marginal teeth, point of first marginal tooth 0.38 mm. from tip of apical tooth. Postmentum shaped as in figure, less than twice as wide in broadest part as in narrowest. Antenna with 11 to 12 articles; third equal to or shorter than second, fourth equal to or longer than third. Pronotum almost as broad as head, in some individuals broader; anterior margin concave; sides convex; posterolateral margin slightly concave before joining the slightly emarginate posterior margin. Femur slender.

TABLE 11
MEASUREMENTS (IN MILLIMETERS) OF SIX SOLDIERS OF *Glyptotermes kirbyi*, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	2.14	2.14-2.25	2.19
Width of head	1.22	1.22-1.39	1.30
Height of head	1.13	1.13-1.24	1.18
Length of left mandible	1.01	1.01-1.09	1.06
Maximum width of postmentum	0.45	0.45-0.47	0.46
Minimum width of postmentum	0.23	0.23-0.30	0.28
Length of postmentum	1.54	1.46-1.65	1.56
Median length of pronotum	0.64	0.60-0.77	0.66
Maximum length of pronotum	0.79	0.79-0.90	0.83
Width of pronotum	1.35	1.29-1.54	1.35
Length of hind tibia	0.90	0.90-0.98	0.92

COMPARISONS: *Glyptotermes kirbyi* closely resembles *G. concavifrons*, new species, from Java, and *G. dilatatus* (Bugnion and Popoff) from Ceylon. It is distinguishable from *G. dilatatus* as follows: it has a depressed and concave forehead and shorter mandibles, the first marginal tooth of the left mandible is closer to the tip of the apical tooth, the postmentum is

less constricted in the middle, and the pronotum is broader, with its posterolateral margins slightly concave. In *Glyptotermes concavifrons* the mandibles are longer, the tip of the first marginal tooth in the left mandible is farther (0.48 mm.) from the tip of the apical tooth, and the posterior margin is longer, and the pronotum is narrower and shorter. In *G. brevicaudatus* (Haviland) the head is longer and broader, the mandibles are shorter, the anterodorsal prominences on the forehead are feeble and blunt, and the pronotum is narrower, with its posterolateral margins rounded.

TYPE LOCALITY: Swamp forest of Kateman, east coast of southern Sumatra (type locality), soldiers (holotype and paratypes), third-form king and queen, nymphs, collected by H. Kirby, no. T-4562, May, 1935; imagoes (morphotype and paramorphotypes), nymphs, collected by H. Kirby, no. T-4538, May, 1935.

The species is named in honor of the late Harold Kirby, Jr., Professor of Zoology, University of California, Berkeley, California.

ETHIOPIAN SPECIES

Glyptotermes hendrickxi, new species

SOLDIER (FIG. 12): Head reddish brown, frons dark brown, approaching black; mandibles shiny black, brownish black at bases; postmentum reddish brown, bordered on sides by a dark brown strip; pronotum same color as posterior part of head, with yellowish patches; labrum and legs yellowish; antennae brownish; tergites light yellowish brown. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc; labrum with about nine to 10 long bristles. Head long and stocky; sides almost parallel, except near middle slightly concave; indentation in middle of frons broad; anterodorsal prominences moderately distinct; forehead in profile sloping at an angle of approximately 60 degrees. Y suture visible. Eyes small, obscured by dark color of head. Labrum with sides converging anteriorly into a blunt point. Mandibles short and robust, outer margins evenly rounded; left mandible with three marginal teeth; right mandible with two marginal teeth, point of first marginal tooth 0.38 mm. from tip of apical tooth. Postmentum markedly constricted in proximal half, slightly more than twice as wide in broadest part as in narrowest; anterior margin straight. Antenna with 13 articles; second longer than third or fourth, third shorter than fourth. Pronotum slightly narrower than head; anterior margin concave; posterolateral corners broadly rounded; posterior margin almost straight. Femur moderately swollen.

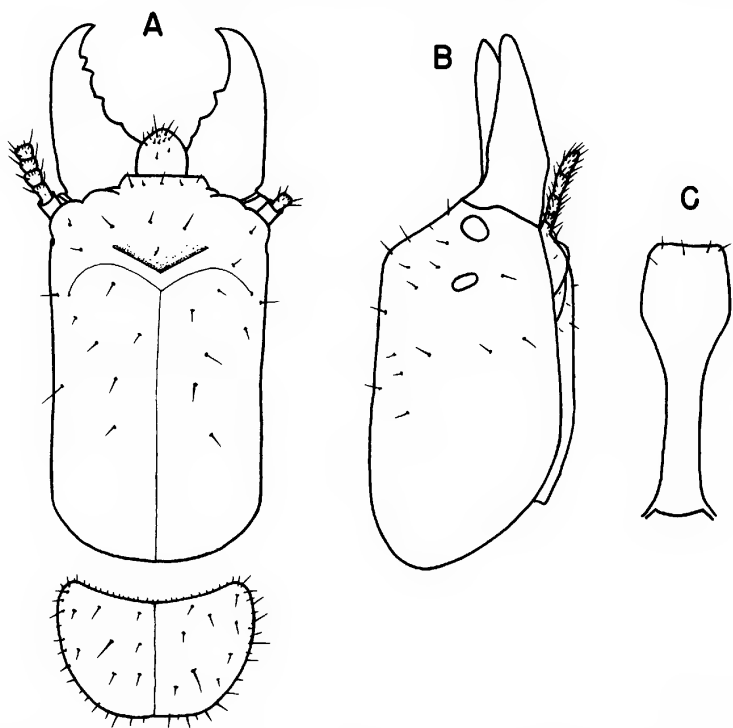


FIG. 12. Soldier of *Glyptotermes hendrickxi*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony.

TABLE 12
MEASUREMENTS (IN MILLIMETERS) OF TEN SOLDIERS OF *Glyptotermes hendrickxi*, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	2.10	1.88-2.10	2.00
Width of head	1.24	1.20-1.26	1.22
Height of head	1.13	1.13-1.14	1.13
Length of left mandible	0.96	0.94-0.96	0.95
Maximum width of postmentum	0.53	0.49-0.53	0.51
Minimum width of postmentum	0.23	0.21-0.23	0.22
Length of postmentum	1.54	1.28-1.54	1.43
Median length of pronotum	0.62	0.58-0.64	0.61
Maximum length of pronotum	0.75	0.68-0.75	0.72
Width of pronotum	1.14	1.09-1.16	1.13
Length of hind tibia	0.93	0.82-0.93	0.90

COMPARISONS: In *Glyptotermes kawandae* Wilkinson the head is slightly broader, the mandibles have a distinct basal hump, the postmentum is more constricted in the proximal half, the antenna is 13-jointed, and the pronotum is wider, with its posterior margin distinctly indented in the middle. In *Glyptotermes insulanus* Silvestri the head is larger, the anterodorsal prominences on the forehead are more feeble, the mandibles are shorter and more robust, the sides of the anterior third of the postmentum are almost parallel, the antenna is 12-jointed, and the pronotum is larger, with its anterior margin angular and its posterior margin slightly indented in the middle. *Glyptotermes parki*, new species, is smaller throughout, and the anterodorsal prominences on its forehead are not so prominent. *Glyptotermes longuisculus*, new species, is smaller in all respects, and the anterodorsal prominences on its forehead are more feeble.

TYPE LOCALITY: Tchibinda Forest on Mt. Bukulumusa above Mulungu (latitude 2° 20' S., longitude 28° 43' E.), elevation 2250–2300 meters, the Congo (type locality), soldiers (holotype and paratypes), nymphs, collected by A. E. Emerson, April 29, 1948, in dead fallen tree of *Polyscias fulva*.

The species is named in honor of M. F. L. Hendrickx, former Regional Director of the Institut National pour l'Étude Agronomique du Congo Belge, Mulungu, the Congo.

***Glyptotermes jurioni*, new species**

IMAGO (FIG. 13): Head smoky brown, lighter in front, region below antennal socket and bases of mandibles light brown; pronotum same color as anterior region of head; antennae brown, articles whitish at tips; labrum yellowish; tibia light yellow; femur brown; tergites dark smoky brown; sternites lighter; wing scale smoky brown; wing membrane lighter than scale. Head and pronotum moderately covered with both long and short bristles. Head posterior to eyes broadly U shaped. Y suture faintly visible. Eyes shaped as in figure. Ocellus ovaloid, touching the eye, slightly pointed. Antenna with 12 articles; third equal to or slightly longer than second, fourth shorter than second or third. Pronotum narrower than head; anterior margin concave; sides rounded; posterior margin straight.

COMPARISONS: *Glyptotermes jurioni* differs from *G. parki*, new species, as follows: it has a narrower head, the eyes are smaller and of a different shape, and the pronotum is shorter, with its anterolateral corners broader and its posterior margin straight. *Glyptotermes ignotus* Wilkinson closely resembles *G. jurioni* but differs in having a slightly longer and broader head, longer and broader wings, and more convex sides of the pronotum.

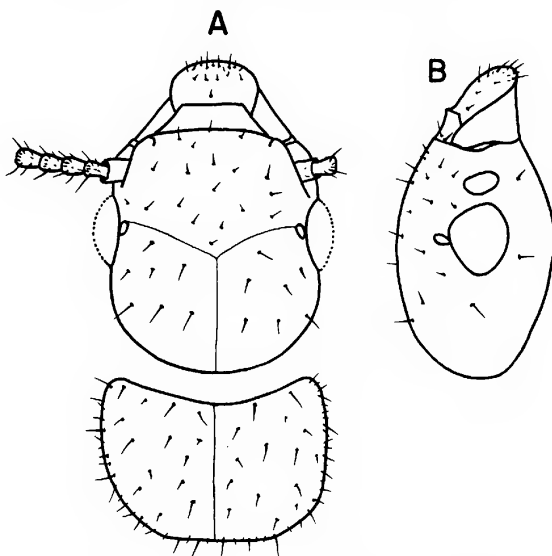


FIG. 13. Morphotype imago of *Glyptotermes jurioni*, new species. A. Head and pronotum from above. B. Head from side.

SOLDIER (FIG. 14): Head brown, in front dark brown; mandibles reddish brown at bases, blackish at tips; pronotum brown, with yellow patches; antennae, labrum, legs, and tergites brownish. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head long, broader posteriorly; frons in middle slightly depressed; anterodorsal prominences indistinct; forehead in profile sloping at an angle of approximately 45 degrees. Labrum with sides

TABLE 13
MEASUREMENTS (IN MILLIMETERS) OF A SINGLE MORPHOTYPE FEMALE IMAGO OF
Glyptotermes jurioni, NEW SPECIES

Length of head to tip of labrum	1.05
Length of head to side base of mandibles	0.83
Width of head	0.83
Diameter of eye	0.25
Eye from lower margin	0.13
Length of ocellus	0.07
Median length of pronotum	0.49
Width of pronotum	0.79
Length of hind tibia	0.64
Length of forewing from suture	4.50
Width of forewing	1.28

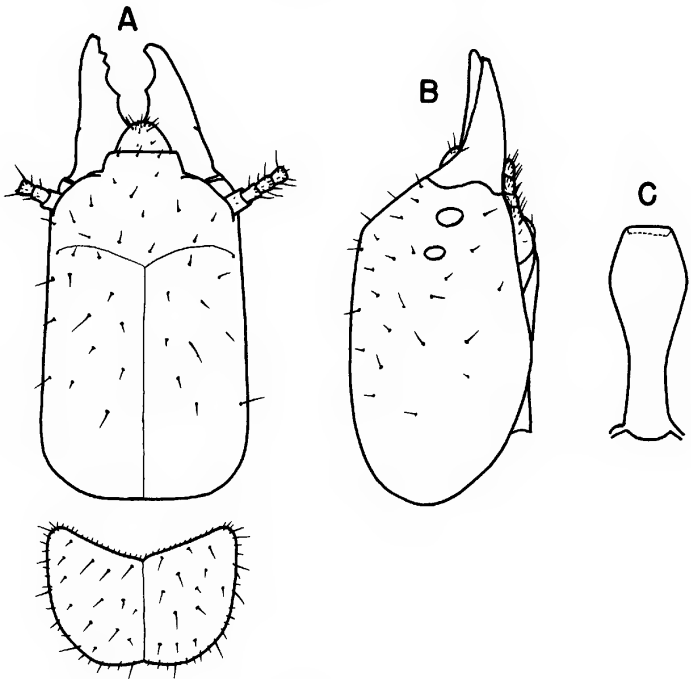


FIG. 14. Holotype soldier of *Glyptotermes jurioni*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

converging in front, anterior margin rounded. Mandibles short, outer margins evenly curved; left mandible with three marginal teeth, posterior margin of second and anterior margin of third forming a broadly concave

TABLE 14
MEASUREMENTS (IN MILLIMETERS) OF HOLOTYPE SOLDIER OF
Glyptotermes jurioni, NEW SPECIES

Length of head to side base of mandibles	1.39
Width of head	0.92
Height of head	0.83
Length of left mandible	0.64
Maximum width of postmentum	0.36
Minimum width of postmentum	0.15
Length of postmentum	0.98
Median length of pronotum	0.45
Maximum length of pronotum	0.53
Width of pronotum	0.83
Length of hind tibia	0.64

cutting edge; right mandible with two marginal teeth. Postmentum shaped as in figure; sides from broadest part converging anteriorly. Antenna with 10 to 11 articles; second longer than third or fourth, third longer than fourth. Pronotum slightly narrower than head; anterior margin deeply angular; sides somewhat straight; posterior margin emarginate. Femur slender.

COMPARISONS: *Glyptotermes sinomalatus*, new species, differs from *G. jurioni* in having a smaller head, a sinuate outer margin of the mandible, and a broadly concave anterior margin of the pronotum. *Glyptotermes ignotus* Wilkinson closely resembles *G. jurioni*, but can be distinguished from it as follows: it has a longer and broader head, the mandible has a prominent basal hump, and the pronotum is broader, with its anterior margin concave and its posterolateral margins more broadly rounded. In *Glyptotermes parvulus* (Sjöstedt) the forehead is steeper, the anterolateral corners of the frons are more prominent, and in the left mandible the posterior margin of the second marginal tooth and the anterior margin of the third marginal tooth form an angular cutting edge.

TYPE LOCALITY: Yangambi (latitude 0° 47' N., longitude 24° 23' E.), the Congo (type locality), one imago (morphotype), one soldier (holotype), collected by A. E. Emerson, May 29, 1948, in wood in forest.

The species is named in honor of M. Fl. Jurion, former Director General of the Institut pour l'Étude Agronomique du Congo Belge at Yangambi.

***Glyptotermes longuisculus*, new species**

Glyptotermes sp. nov. KIRBY, 1942a, p. 116 (Protozoa).

Glyptotermes sp. nov. KIRBY, 1942b, p. 183 (Protozoa).

Glyptotermes sp. nov. KIRBY, 1945, p. 257 (Protozoa).

IMAGO (FIG. 15): Head brown, lighter in region of postclypeus and below antennal sockets; antennae brown, with tips of articles whitish; femur brown; tergites brown; sternites whitish or pale yellow; wing membrane smoky; wing scale darker than wing membrane. Head covered with a few scattered, erect bristles; margins and surface of pronotum with both long and short bristles. Head broadly and evenly rounded posteriorly. Y suture visible. Eyes large and swollen, shaped as in figure. Ocellus suboval, pointed at tip, touching the eye. Antenna with 13 to 14 articles; second article longer or equal to third, fourth shorter than third. Anterior margin of pronotum broadly concave; sides rounded; posterior margin slightly emarginate. Hind wing with media branching from radial sector, outside wing scale, at about 0.90 mm. from suture.

COMPARISONS: In *Glyptotermes parki*, new species, the head is narrower,

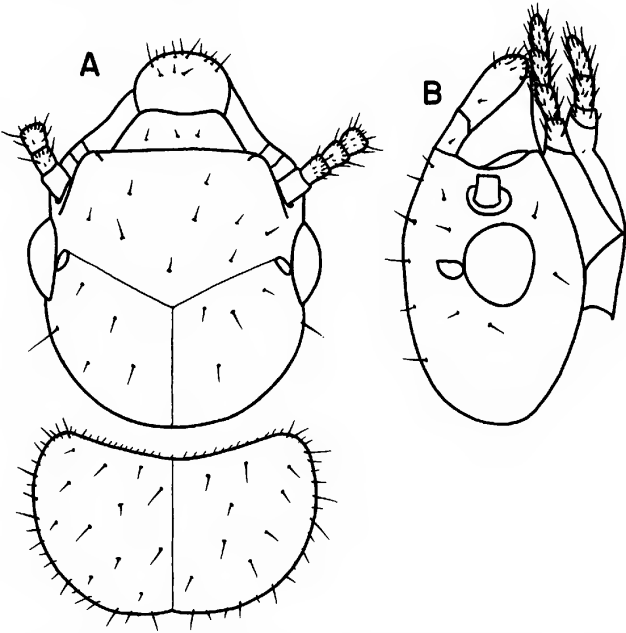


FIG. 15. Imago of *Glyptotermes longuisculus*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

the ocellus is more oval and is at an angle to the eye, the eyes are less swollen and of a different shape (fig. 17), the pronotum is narrower and its sides are less convex, and the tibia is shorter. *Glyptotermes jurioni*, new species, *G. sinomalatus*, new species, and *G. ueleensis* Coaton are smaller

TABLE 15
MEASUREMENTS (IN MILLIMETERS) OF EIGHT IMAGOS OF *Glyptotermes longuisculus*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.20-1.28	1.26
Length of head to side base of mandibles	0.94-0.98	0.96
Width of head	1.05-1.09	1.07
Diameter of eye	0.29-0.32	0.31
Eye from lower margin	0.13-0.15	0.14
Length of ocellus	0.07-0.08	0.08
Median length of pronotum	0.56-0.58	0.57
Width of pronotum	0.94-1.01	0.98
Length of hind tibia	0.90	0.90
Length of forewing from suture	6.53-6.90	6.68
Width of forewing	1.73-1.80	1.74

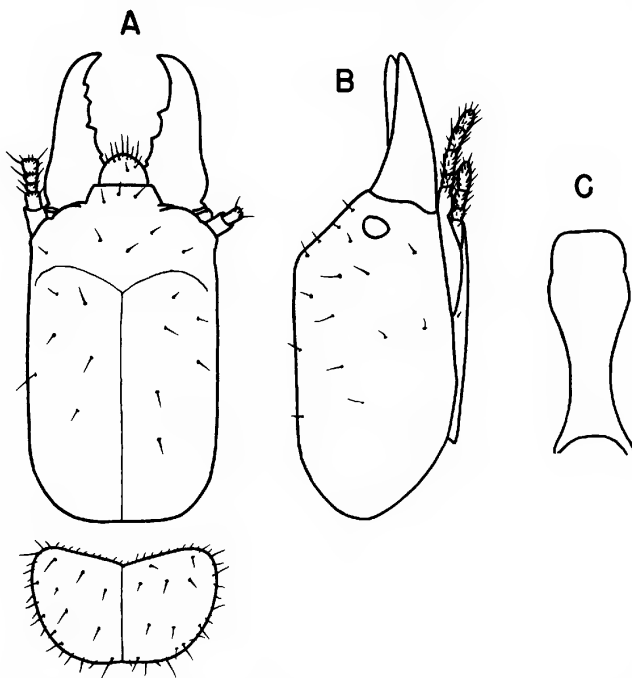


FIG. 16. Soldier of *Glyptotermes longisculus*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony.

in all measurements. In *G. insulanus* Silvestri the forewing is shorter and narrower, the eye shape is different, the ocellus is larger, the anterolateral corners of the pronotum are narrower, and the antenna has 12 articles. In *Glyptotermes kawandae* Wilkinson the head is wider, the eye shape is different, the ocellus does not touch the eye, the sides of the pronotum are more straight, and the wings are slightly shorter.

SOLDIER (FIG. 16): Head brown, darker anteriorly; mandibles reddish brown, lighter at bases, pronotum ochraceous; antennae and legs yellowish; tergites and sternites whitish. Head with a few scattered, erect, and short bristles; pronotum with a few long and many short bristles along margins and on disc. Head long and narrow; sides almost parallel; frons depressed medially, depression broad and feeble; anterodorsal prominences very weak; frontal slope slightly concave; forehead in profile sloping at an angle of approximately 40 degrees. Y suture faintly visible. Eyes small. Labrum tongue-shaped. Mandibles shaped as in figure, outer basal margins rough; left mandible with three marginal teeth, first narrow-based, second and third wide-based; right mandible with two

TABLE 16
MEASUREMENTS (IN MILLIMETERS) OF SEVEN SOLDIERS OF *Glyptotermes*
longiusculus, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.69	1.69–1.88	1.76
Width of head	1.07	1.07–1.13	1.11
Height of head	0.98	0.98–1.01	1.00
Length of left mandible	0.86	0.86–0.90	0.88
Maximum width of postmentum	0.49	0.45–0.49	0.46
Minimum width of postmentum	0.23	0.23	0.23
Length of postmentum	1.13	1.13–1.28	1.19
Median length of pronotum	0.56	0.53–0.58	0.56
Maximum length of pronotum	0.64	0.64–0.68	0.66
Width of pronotum	1.01	0.98–1.05	1.01
Length of hind tibia	0.78	0.78–0.82	0.80

marginal teeth, point of first marginal tooth 0.34 mm. from tip of apical tooth. Postmentum twice as wide in broadest part as in narrowest; anterior margin straight. Antenna with 12 to 13 articles; in antenna with 12 articles, third equal to fourth; in antenna with 13 articles, third shorter than fourth. Pronotum slightly narrower than head; anterior margin angular; anterolateral corners broadly rounded; posterolateral margins broadly rounded; posterior margin very slightly indented in middle. Femur slender.

COMPARISONS: In *Glyptotermes ueleensis* Coaton the head is shorter, the forehead slope is steeper, the mandibles are shorter, more robust, and with a distinct basal hump, the posterior margin of the second marginal tooth and the anterior margin of the third marginal tooth of the left mandible form a concave cutting edge, and the anterolateral and posterolateral corners of the pronotum are less broadly rounded. *Glyptotermes parki*, new species, closely resembles *G. longiusculus*, but differs as follows: the anterodorsal margins of the forehead are slightly raised into lateral prominences, the frons is more depressed in the middle, and the anterior third of the postmentum is shorter. *Glyptotermes insulanus* Silvestri is larger throughout, and in it the forehead is steeper, the mandibles are more robust, the posterior margin of the second marginal tooth and the anterior margin of the third marginal tooth in the left mandible form a concave cutting edge, and the anterolateral corners of the pronotum are narrower. In *G. kawandae* Wilkinson the measurements are all larger, the forehead is steeper, and the hind margin of the pronotum is deeply indented in the middle. *Glyptotermes jurioni*, new species, and *G. sinomala-tus*, new species, are much smaller.

TYPE LOCALITY: Twenty-eight miles south of Rutshuru (latitude $1^{\circ} 10'$ S., longitude $29^{\circ} 26'$ E.), the Congo (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), nymphs, collected by H. Kirby, no. T-3018, December 25, 1934.

***Glyptotermes parki*, new species**

Glyptotermes sp. nov. KIRBY, 1942a, p. 116 (Protozoa).

Glyptotermes sp. nov. KIRBY, 1942b, p. 183 (Protozoa).

Glyptotermes sp. nov. KIRBY, 1944, p. 196 (Protozoa).

Glyptotermes sp. nov. KIRBY, 1945, p. 257 (Protozoa).

DEALATE FEMALE IMAGO (FIG. 17): Head and pronotum rusty brown; labrum, antennae, and legs yellowish brown; tergites rusty brown, lighter than head and pronotum; wing scale smoky brown. Head with a few scattered, short, and erect bristles; pronotum covered with both long and short bristles along margins and on disc. Head posterior to eyes evenly rounded. Y suture present but indistinct owing to dark color of head. Eyes small, not so swollen, shaped as in figure. Ocellus oval, touching the eye. Antenna broken; second article slightly longer than third, fourth shorter than third. Pronotum narrower than head; anterior margin evenly and broadly concave; anterolateral corners narrow; sides in some cases straight; posterior margin straight.

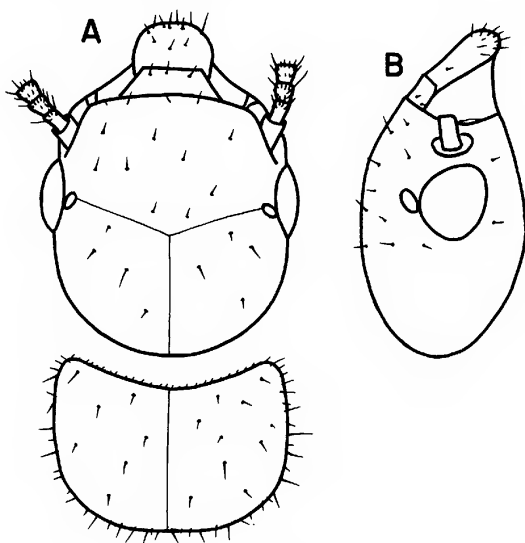


FIG. 17. Imago of *Glyptotermes parki*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from morphotype colony.

TABLE 17
MEASUREMENTS (IN MILLIMETERS) OF TWO DEALATE FEMALE IMAGOS OF
Glyptotermes parki, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.13	1.13
Length of head to side base of mandibles	0.90-0.94	0.92
Width of head	0.94	0.94
Diameter of eye	0.29	0.29
Eye from lower margin	0.13-0.14	0.14
Length of ocellus	0.08	0.08
Median length of pronotum	0.53-0.60	0.56
Maximum length of pronotum	0.60-0.68	0.64
Width of pronotum	0.79-0.86	0.82
Length of hind tibia	0.79	0.79
Length of forewing scale	0.75	0.75

COMPARISONS: *Glyptotermes longuisculus*, new species, closely resembles *G. parki*. In *G. longuisculus* the head is broader, the eyes are more swollen and of a different shape (fig. 15), the ocellus is somewhat roundish, the pronotum is wider, with its anterolateral corners broader, its sides more convex, and its posterior margin slightly emarginate, the wing scale is slightly larger, and the tibia is longer. *Glyptotermes ignotus* Wilkinson, *G. reticulatus* Wilkinson, and *G. sinomalatus*, new species, are smaller in all respects. In *G. kawandae* Wilkinson the head and pronotum are larger, the ocellus does not touch the eye, and the shape of eye is different. *Glyptotermes insulanus* Silvestri is larger throughout, and the shape of its eye is different.

SOLDIER (FIG. 18): Head posteriorly and sides yellowish brown, region on each side of Y suture and eyes brown, frontal region reddish brown; mandibles dark reddish brown at bases, shiny and blackish at tips; labrum yellowish; eyes whitish; antennae yellow; pronotum yellowish brown; legs pale yellow; tergites whitish, with a yellowish tinge. Head with a few scattered, short bristles; pronotum with a few long and many short bristles along margins and on disc; labrum with about eight to nine long bristles. Head long; sides parallel, narrowing slightly before antennal sockets; incision in middle of frons broad; anterodorsal prominences faintly distinct; forehead in profile sloping at an angle of approximately 45 degrees. Y suture clearly visible. Eyes small. Labrum with posterolateral sides parallel, anteriorly sides converging into a blunt point. Mandibles short, outer margins at bases uneven; left mandible with three marginal teeth; right mandible with two marginal teeth, point of first marginal

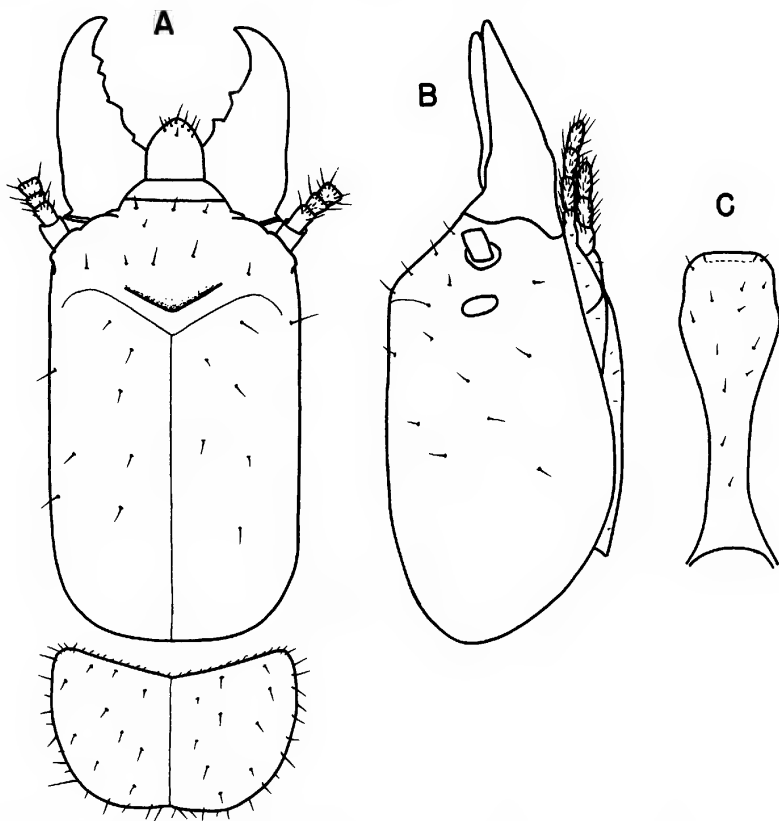


FIG. 18. Holotype soldier of *Glyptotermes parki*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

tooth 0.30 mm. from tip of apical tooth. Postmentum long; markedly constricted in proximal half, sides from broadest part converging anteriorly; anterior margin almost straight. Antenna with 11 to 13 articles; third shortest, second longer than or equal to fourth. Pronotum slightly narrower than head; anterior margin widely angular; anterolateral corners narrow; in type colony, posterolateral margins broadly rounded; in paratype colony, posterolateral margins relatively less broadly rounded; posterior margin with a faint indentation in middle. Femur not swollen.

COMPARISONS: *Glyptotermes longiusculus*, new species, closely resembles *G. parki*, but differs in the fact that the frons is less depressed in the middle, the anterodorsal margins of the forehead are not raised into lateral prominences, and the anterior third of the postmentum is longer. In *G. hendrickxi*, new species, the head is longer, broader, and thicker, the

TABLE 18
MEASUREMENTS (IN MILLIMETERS) OF SOLDIERS OF *Glyptotermes parki*, NEW SPECIES

	Holotype	Paratypes Type Colony Range	Paratypes, Beni Range	Morphotype Colony Range
Length of head to side base of mandibles	1.73	1.69-1.80	1.65-1.84	1.65-1.73
Width of head	1.13	1.05-1.11	1.03-1.05	0.99-1.01
Height of head	1.05	0.98-1.05	0.94-0.98	0.92-0.98
Length of left mandible	0.83	0.83-0.84	0.79-0.83	0.75
Maximum width of postmentum	0.45	0.41-0.45	0.41	0.45
Minimum width of postmentum	0.23	0.19-0.23	0.17-0.19	0.13-0.19
Length of postmentum	1.28	1.20-1.31	1.13-1.28	1.13-1.18
Median length of pronotum	0.60	0.53-0.60	0.49-0.53	0.54-0.56
Maximum length of pronotum	0.62	0.60-0.68	0.62-0.66	0.65-0.68
Width of pronotum	1.01	0.99-1.09	0.94-0.99	0.90-0.94
Length of hind tibia	0.75	0.71-0.75	0.68-0.71	0.69

anterodorsal prominences on the forehead are more prominent, and the pronotum is longer and broader. *Glyptotermes jurioni*, new species, *G. parvulus* (Sjöstedt), and *G. sinomalatus*, new species, are smaller in all respects. In *G. kawandae* Wilkinson the size is larger throughout, and the posterior margin of the pronotum is more deeply indented in the middle. In *G. ueleensis* Coaton the middle of the forehead has a narrower incision, the mandibles are more robust, the posterior margin of the second marginal tooth and the anterior margin of the third marginal tooth of the left mandible form a concave cutting edge, and the anterior margin of the pronotum is concave. In *G. insulanus* Silvestri the measurements are all larger, and the dentition is like that of *G. ueleensis*.

TYPE LOCALITY AND DISTRIBUTION: Kakitumba (latitude 1° 04' S., longitude 30° 26' E.), Ruanda-Urundi (type locality), soldiers (holotype and paratypes), nymphs, collected by H. Kirby, no. T-3022, December 28, 1934. Road below Mulungu (latitude 2° 20' S., longitude 28° 48' E.), Kivu Province, the Congo, dealate imagoes (morphotype and paramorphotypes), soldiers (paratypes), nymphs, collected by A. E. Emerson, April 29, 1948, in dead portion of a living trunk. Five kilometers north-west of cross road south of Beni (approximate latitude 0° 29' N., longitude 29° 27' E.), the Congo, elevation 3600 feet, beginning of rain forest, soldiers (paratypes), nymphs, collected by A. E. Emerson, May 10, 1948.

The species is named in honor of Dr. Thomas Park, Professor of Zoology at the University of Chicago.

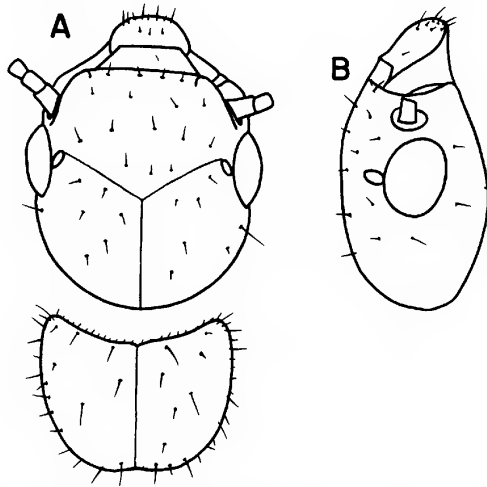


FIG. 19. Dealate imago of *Glyptotermes sinomalatus*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from morphotype colony.

***Glyptotermes sinomalatus*, new species**

DEALATE IMAGO (FIG. 19): Head dark brown; pronotum of almost same color as head; antennae and femur light brown; tibia yellowish; tergites brown, lighter than head and pronotum; sternites lighter than tergites. Head with a few scattered, erect bristles; pronotum covered with both long and short bristles along margins and on disc. Head posterior to eyes semicircular. Eyes shaped as in figure. Ocellus ovaloid, touching

TABLE 19
MEASUREMENTS (IN MILLIMETERS) OF FIVE DEALATE IMAGOS OF
Glyptotermes sinomalatus, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	0.98–1.05	1.01
Length of head to side base of mandibles	0.79–0.81	0.79
Width of head	0.83–0.86	0.84
Diameter of eye	0.25–0.29	0.27
Eye from lower margin	0.09–0.13	0.12
Length of ocellus	0.05–0.07	0.06
Median length of pronotum	0.45–0.49	0.47
Width of pronotum	0.68–0.75	0.71
Length of hind tibia	0.66–0.70	0.69

the eye. Antenna broken; second article equal to third, fourth shorter than second or third. Pronotum slightly narrower than head; anterior margin concave; anterolateral corners narrow; posterior margin slightly emarginate.

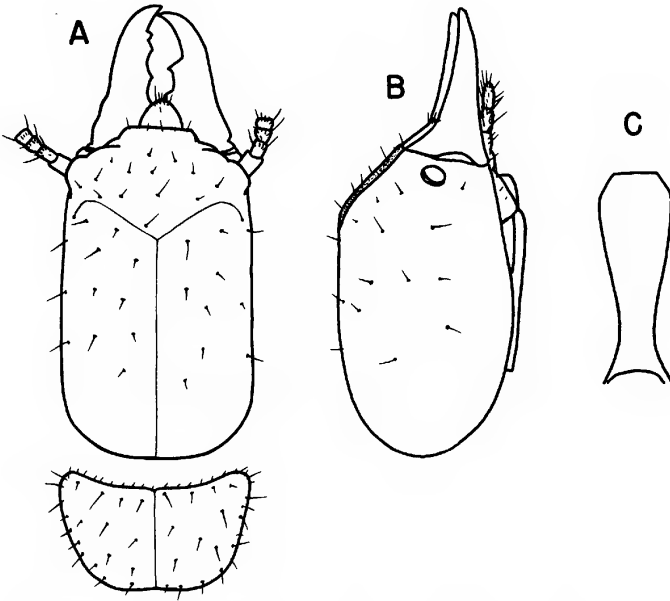


FIG. 20. Soldier of *Glyptotermes sinomalatus*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony.

COMPARISONS: In *Glyptotermes jurioni*, new species, the head is narrower, the eyes are smaller and of a different shape, and the pronotum is shorter, with its anterolateral corners broader and its posterior margin straight. In *Glyptotermes ignotus* Wilkinson the head is slightly broader, the eyes are of a different shape, the ocellus is more roundish, and the pronotum is broader, with its sides more rounded. In *G. reticulatus* Wilkinson the head is narrower, the eyes are smaller and of a different shape, the ocellus is very close to but does not touch the eye, and the pronotum is shorter, with its posterolateral margins angular. *Glyptotermes kawandae* Wilkinson, *G. insulanus* Silvestri, *G. parki*, new species, and *G. longuisculus*, new species, are larger in all respects.

SOLDIER (FIG. 20): Head yellow, with light brownish tinge, frontal region brown; pronotum yellowish, lighter than head; mandibles reddish

brown; antennae, legs, and tergites pale yellow. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head small; sides parallel; frons in middle very faintly depressed; anterodorsal prominences indistinct; forehead in profile sloping at an angle of approximately 40–45 degrees. Labrum with sides converging in front; anterior margin blunt. Mandibles short, outer margins sinuate at bases; left mandible with three marginal teeth, posterior margin of second and anterior margin of third forming a concave cutting edge; right mandible with two marginal teeth, point of first marginal tooth 0.24 mm. from tip of apical tooth. Postmentum shaped as in figure; variable in shape; sides in some cases slightly angular in distal region. Antenna with 10 to 11 articles; in antenna with 10 articles, third article subequal to fourth; in antenna with 11 articles, third article shorter than fourth. Pronotum slightly narrower than head; anterior margin broadly concave, with a slight notch in middle; anterolateral corners narrow; sides converging posteriorly; posterior margin slightly emarginate. Femur not swollen.

TABLE 20
MEASUREMENTS (IN MILLIMETERS) OF FIVE SOLDIERS OF
Glyptotermes sinomalatus, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.31	1.26–1.37	1.33
Width of head	0.86	0.86–0.90	0.88
Height of head	0.83	0.82–0.83	0.83
Length of left mandible	0.66	0.64–0.68	0.67
Maximum width of postmentum	0.30	0.30–0.34	0.32
Minimum width of postmentum	0.15	0.13–0.15	0.15
Length of postmentum	0.90	0.83–0.94	0.89
Median length of pronotum	0.40	0.39–0.43	0.41
Maximum length of pronotum	0.53	0.45–0.53	0.51
Width of pronotum	0.83	0.79–0.83	0.82
Length of hind tibia	0.54	0.54–0.60	0.58

COMPARISONS: *Glyptotermes jurioni*, new species, differs from *G. sinomalatus* in the following respects: the head is wider posteriorly, the outer margins at the bases of the mandibles are not sinuate, and the anterior margin of the pronotum is angular and deeply incised and the posterior margin distinctly emarginate. In *Glyptotermes ignotus* Wilkinson all measurements are slightly larger, the mandibles have a more prominent basal hump, the sides of the anterior half of the postmentum are parallel, and the anterolateral corners of the pronotum are broader. In *G. parvulus*

(Sjöstedt) the head is larger, the anterolateral corners of the frons are more prominent, the posterior margin of the second marginal tooth and the anterior margin of the third marginal tooth of the left mandible form an angular cutting edge, and the anterior margin of the pronotum is angular. In *G. reticulatus* Wilkinson the head is longer, the first and second marginal teeth in the right mandible are closer together, forming a broad, V-shaped, cutting edge, and the pronotum is shorter and broader and its sides are straight. *Glyptotermes parki*, new species, *G. longuisculus*, new species, *G. kawandae* Wilkinson, *G. ueleensis* Coaton, and *G. insulanus* Silvestri are much larger in all respects.

TYPE LOCALITY: Camp Putnam (latitude 1° 24' N., longitude 28° 36' E.), on the Epulu River, the Congo (type locality), soldiers (holotype and paratypes), nymphs, collected by A. E. Emerson, May 17, 1948, from hard wood of living tree on edge of the river; dealate imagoes (morphotype and paramorphotype) collected by A. E. Emerson, May 17, 1948, from hard wood of living tree on edge of river.

REMARKS: It seems reasonable to associate the imagoes with this species, since they were collected in the same place as were the soldiers.

NEOTROPICAL SPECIES

Glyptotermes adamsoni, new species

Glyptotermes sp. ADAMSON, 1940, p. 13 (biology and distribution).

IMAGO (FIG. 21): Head, pronotum, and tergites reddish brown, frons lighter; T-shaped marking in center of pronotum; antennae and legs

TABLE 21
MEASUREMENTS (IN MILLIMETERS) OF SIX IMAGOS OF *Glyptotermes adamsoni*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.01–1.20	1.08
Length of head to side base of mandibles	0.86–0.90	0.88
Width of head	0.83–0.94	0.90
Diameter of eye	0.27–0.28	0.27
Eye from lower margin	0.11	0.11
Length of ocellus	0.11–0.13	0.11
Median length of pronotum	0.45–0.49	0.47
Maximum length of pronotum	0.53–0.60	0.54
Width of pronotum	0.79–0.85	0.82
Length of hind tibia	0.68	0.68
Length of forewing from suture	5.37–5.44	5.39
Width of forewing	1.44–1.56	1.49

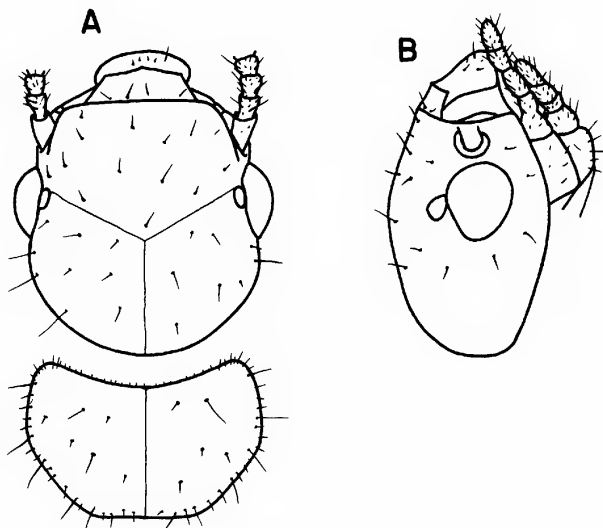


FIG. 21. Imago of *Glyptotermes adamsoni*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

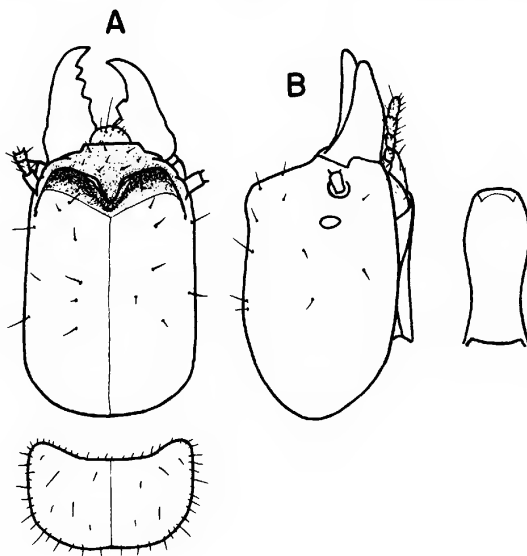


FIG. 22. Soldier of *Glyptotermes adamsoni*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony.

brownish; wings smoky brown, wing scale darker. Head with a few scattered, erect bristles; pronotum covered with both long and short bristles along margins and on disc. Head longer than broad. Y suture faint. Eyes shaped as in figure. Ocellus touching the eye. Antenna with 12 articles; second article longer than third or fourth, third subequal to fourth. Pronotum narrower than head; anterior margin concave; anteriorly the sides rounded, posteriorly sides sloping at an angle to meet the straight posterior margin. Hind wing with media branching from radial sector, outside wing scale, at about 0.60 mm. from suture.

COMPARISONS: In *Glyptotermes pellucidus* Emerson the eyes are larger, the head and pronotum are longer and broader, the sides of the pronotum are straight, the antenna has 13 articles, and the forewing is longer and broader. *Glyptotermes tuberifer*, new species, differs from *G. adamsoni* in the following respects: the head and pronotum are broader, the ocellus is longer and narrower and at an angle to the eye, the eyes are slightly larger, the wings are shorter and narrower, and the tibia is longer. In *G. parvoculatus*, new species, the wings are longer and broader, the eyes are smaller, the antenna has 12 to 13 articles, and the pronotum is longer.

SOLDIER (FIG. 22): Head yellowish brown, frons reddish brown; mandibles fuscous; pronotum as dark as posterior region of head; antennae yellow; legs and tergites brownish. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc; tergites moderately covered with bristles and hairs. Head elongate; sides parallel, slightly narrow in front; forehead in profile nearly vertical, in some specimens sloping at an angle; bilobed, with a deep and

TABLE 22

MEASUREMENTS (IN MILLIMETERS) OF SEVEN SOLDIERS OF *Glyptotermes adamsoni*, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.43	1.28-1.43	1.34
Width of head	1.01	0.92-1.01	0.97
Height of head	0.96	0.86-0.96	0.88
Length of left mandible	0.68	0.68-0.69	0.68
Maximum width of postmentum	0.38	0.34-0.38	0.35
Minimum width of postmentum	0.28	0.26-0.30	0.26
Length of postmentum	0.83	0.75-0.83	0.79
Median length of pronotum	0.49	0.40-0.53	0.45
Maximum length of pronotum	0.60	0.53-0.65	0.62
Width of pronotum	0.96	0.84-0.98	0.92
Length of hind tibia	0.60	0.60	0.60

narrow incision in middle. Y suture inconspicuous. Eyes small, oval. Mandibles short and stout, outer margins at bases uneven; left mandible with three marginal teeth, first and second small and close to each other, third tooth wide-based; right mandible with two marginal teeth, point of first marginal tooth 0.23 mm. from tip of apical tooth. Postmentum shaped as in figure, not strongly constricted in middle. Antenna with 11 articles; third article shorter than second or fourth. Pronotum slightly narrower than head; anterior margin concave; posterolateral margins broadly rounded; posterior margin very faintly indented in middle. Femur swollen.

COMPARISONS: In *Glyptotermes angustus* Snyder and *G. perparvus* Emerson all the measurements are smaller, and the incision in the middle of the forehead is narrower and not so deep and the lobes are not so prominent. In *G. tuberifer*, new species, the head is longer and broader, the lobes on the forehead are more prominent, the incision in the middle of the frons is broader and deeper, and the pronotum is broader, with its anterior margin raised and its posterior margin more strongly indented in the middle.

TYPE LOCALITY AND DISTRIBUTION: Near Arima (latitude 10° 40' N., longitude 61° 20' W.), Trinidad, the West Indies (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), collected by A. M. Adamson, no. 1126, May 27, 1936. Caledonia District, Tobago, the West Indies, imagoes (paramorphotypes), soldiers (paratypes), nymphs, collected by A. M. Adamson, no. 3167, December 27, 1938. First Bocas, Trinidad, the West Indies, dealates (paramorphotypes), soldiers (paratypes), nymphs, collected by A. E. Emerson, February 20, 1924. Mt. Tabor (latitude 10° 40' N., longitude 61° 23' W.), Northern Range, Trinidad, the West Indies, one soldier (paratype), nymphs, collected by A. M. Adamson, no. 3462, November 19, 1939.

The species is named in honor of the late A. M. Adamson, Professor of Zoology, Imperial College of Tropical Agriculture, Trinidad, the West Indies.

Glyptotermes contracticornis (Snyder)

Kalotermes contracticornis SNYDER, 1925b, p. 153.

IMAGO (FIG. 23): Head reddish brown, frons lighter; pronotum yellowish brown; labrum brownish; antennae and legs yellowish; wing scale reddish brown; wing membrane translucent, with a light yellowish tinge. Head moderately covered with both long and short bristles; pronotum with both long and short bristles along margins and on disc. Head

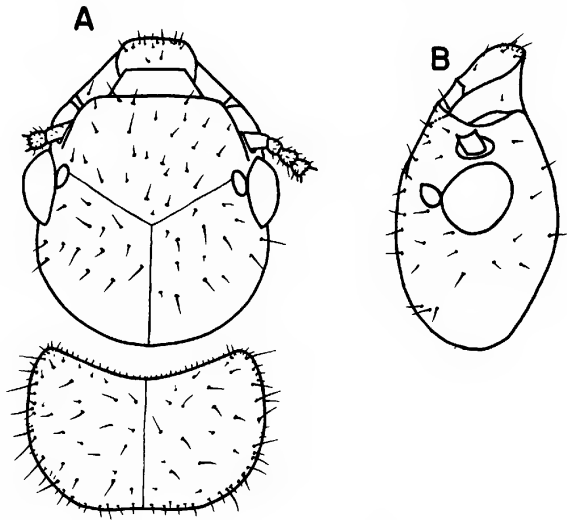


FIG. 23. Imago of *Glyptotermes contracticornis* (Snyder). A. Head and pronotum from above. B. Head from side. Morphotype colony from 8 miles from San José, Costa Rica.

posterior to eyes semicircular. Eyes large and swollen, shaped as in figure. Ocellus oblique, touching the eye. Antenna with 14 to 15 articles; second article longer than third or fourth, third longer than fourth. Pronotum slightly narrower than head; anterior margin broadly concave; sides rounded; posterior margin slightly emarginate. Hind wing with

TABLE 23
MEASUREMENTS (IN MILLIMETERS) OF SEVEN IMAGOS OF *Glyptotermes contracticornis* (SNYDER)

	Range	Mean
Length of head to tip of labrum	1.58-1.88	1.70
Length of head to side base of mandibles	1.28-1.58	1.36
Width of head	1.40-1.48	1.43
Diameter of eye	0.39-0.44	0.42
Eye from lower margin	0.18-0.19	0.18
Length of ocellus	0.15-0.18	0.17
Median length of pronotum	0.70-0.83	0.74
Width of pronotum	1.28-1.48	1.35
Length of hind tibia	1.35-1.50	1.38
Length of forewing from suture	10.53-11.45	10.97
Width of forewing	2.83-2.97	2.92

media branching from radial sector, outside wing scale, at about 1.13 mm. from suture.

DISTRIBUTION: Eight miles south of San José (latitude $9^{\circ} 58' N.$, longitude $84^{\circ} 4' W.$), altitude 5500 feet, Costa Rica, many imagoes (morphotype), soldiers, nymphs, collected by L. Hare, June 10, 1935. Cartago, Costa Rica, soldiers (homotype), collected by H. Kirby, no. T-132, August 14, 1925. Miller's house, 4 miles northwest of El Volcan Post-office, Chiriqui, Panama, elevation 4230 feet, dealates, soldiers (homotype), collected by L. Hare, August 18, 1935; soldiers (homotype), collected by L. Hare, August 17, 1935. The type locality for this species is Navarro, Costa Rica.

REMARKS: Snyder (1925b) based this species on the soldier caste alone, the imagoes being then unknown.

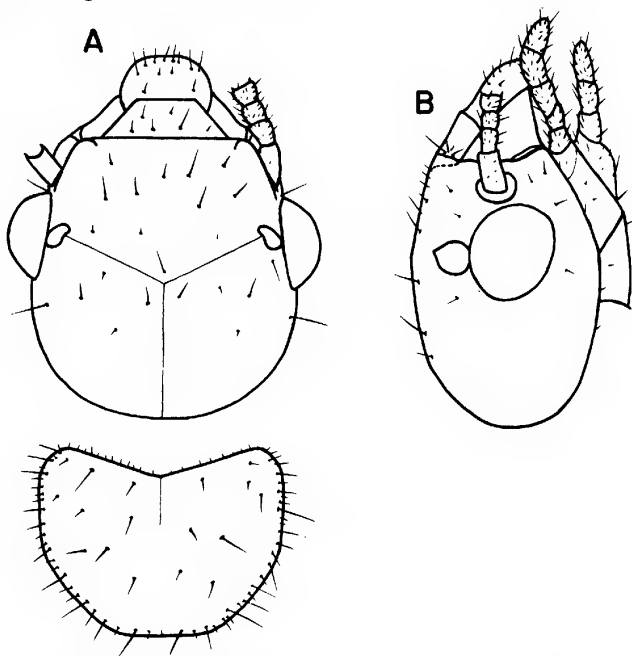


FIG. 24. Imago of *Glyptotermes longipennis*, new species. A. Head and pronotum from above. B. Head from side. Paratype from type colony.

***Glyptotermes longipennis*, new species**

IMAGO (FIG. 24): Head and pronotum brown, frons lighter anteriorly; labrum same color as anterior region of head; antennae and legs yellowish; wing scale brown, with a yellowish tinge; wing membrane light

yellowish; costal area reddish brown; few branches of cubitus brownish, other branches yellowish. Head with a few scattered, erect bristles; labrum and pronotum covered with both long and short bristles; tibia moderately covered with hairs. Head broad. Y suture faintly visible. Eyes large, shaped as in figure. Ocellus suboval, oblique, very close (0.02 mm.) to eye, in some specimens touching the eye. Antenna with 14 articles; second article longer than third or fourth, third equal to fourth. Pronotum narrower than head; anterior margin broadly angular; anterolateral corners broadly rounded; posteriorly sides sloping at an angle to meet the slightly emarginate or straight posterior margin. Wings very long. Hind wing with media branching from radial sector, outside wing scale, at about 1.65 mm. from suture.

TABLE 24
MEASUREMENTS (IN MILLIMETERS) OF SIX IMAGOS OF *Glyptotermes longipennis*, NEW SPECIES

	Holotype	Range	Mean
Length of head to tip of labrum	1.72	1.58-1.72	1.64
Length of head to side base of mandibles	1.35	1.28-1.35	1.31
Width of head	1.39	1.39-1.47	1.43
Diameter of eye	0.46	0.43-0.46	0.44
Eye from lower margin	0.18	0.14-0.18	0.15
Length of ocellus	0.15	0.14-0.16	0.15
Median length of pronotum	0.72	0.70-0.75	0.72
Maximum length of pronotum	0.90	0.86-0.90	0.87
Width of pronotum	1.14	1.09-1.20	1.15
Length of hind tibia	1.35	1.31-1.35	1.34
Length of forewing from suture	14.21	13.15-14.21	13.57
Width of forewing	3.38	3.32-3.39	3.36

COMPARISONS: In the Neotropical Region the imago of *Glyptotermes longipennis* has the longest wings. It differs from *G. hospitalis* Emerson in having larger and more prominent eyes, more broadly rounded antero-lateral corners of the pronotum, and a longer tibia. *Glyptotermes contracticornis* (Snyder) has shorter and narrower wings and a broader pronotum, with its posterolateral margins rounded.

TYPE LOCALITY: San Antonio (latitude 11° 33' N., longitude 72° 47' W.), W. Cord, 1800 meters, Colombia (type locality), imagoes (holotype and paratypes), collected by A. H. Fassl, 1909.

***Glyptotermes parvoculatus*, new species**

IMAGO (FIG. 25): Head yellowish brown, with smoky patches; pronotum

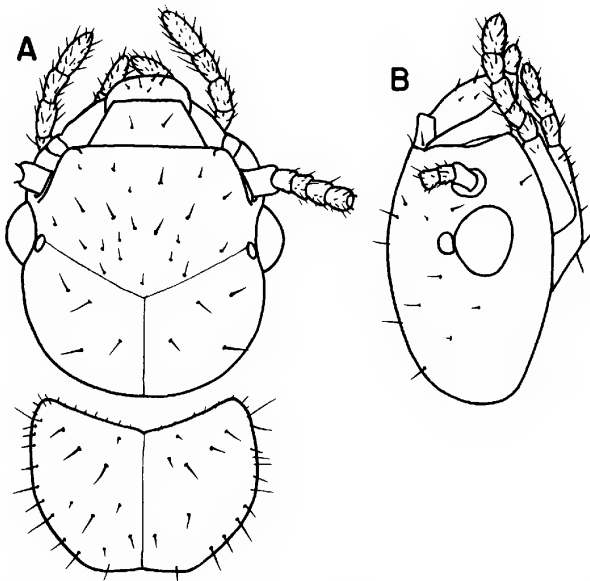


FIG. 25. Imago of *Glyptotermes parvoculatus*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

yellowish brown, lighter than head, T-shaped marking in center (paratype colony with head and pronotum reddish brown); antennae and legs yellowish; tergites reddish brown; wings smoky, wing scale darker. Head with a few scattered, long bristles. Y suture distinct. Eyes small, shaped

TABLE 25
MEASUREMENTS (IN MILLIMETERS) OF SIX IMAGOS OF *Glyptotermes parvoculatus*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.08–1.13	1.11
Length of head to side base of mandibles	0.90–0.94	0.90
Width of head	0.91–0.98	0.94
Diameter of eye	0.24	0.24
Eye from lower margin	0.11–0.14	0.11
Length of ocellus	0.11	0.11
Median length of pronotum	0.49–0.53	0.51
Maximum length of pronotum	0.58–0.66	0.61
Width of pronotum	0.77–0.83	0.80
Length of hind tibia	0.77	0.77
Length of forewing from suture	6.00–6.93	6.29
Width of forewing	1.65–1.80	1.72

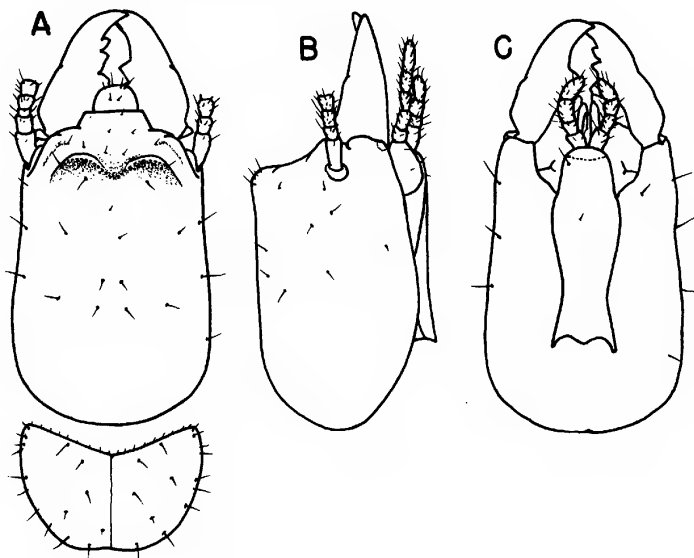


FIG. 26. Soldier of *Glyptotermes parvoculatus*, new species. A. Head and pronotum from above. B. Head from side. C. Head from below. Paratype from type colony.

as in figure. Ocellus small, touching the eye. Antenna with 12 to 13 articles; second article longer than third, third longer than fourth. Pronotum narrower than head; anterior margin deeply emarginate; sides rounded; posterior margin weakly emarginate. Hind wing with media branching from radial sector, outside wing scale, at about 1.15 mm. from suture.

COMPARISONS: *Glyptotermes parvoculatus* differs from *G. tuberifer*, new species, and *G. adamsoni*, new species, in having smaller eyes and longer and broader wings.

SOLDIER (FIG. 26): Head dark brown, frons dark reddish brown, blackish near and above antennal sockets; mandibles fuscous; pronotum and labrum yellowish brown, lighter than head; antennae and legs brownish. Head with a few scattered, erect bristles; pronotum with bristles along margins and on disc; tergites with approximately seven to eight bristles in a row. Head elongate; broader posteriorly, sides slightly converging in front, slightly concave in middle; incision in middle of frons broad and deep; anterodorsal prominences angular and high; forehead in profile concave. Y suture faint. Eyes small. Mandibles stout, outer margins with slight dent in middle; left mandible with three marginal teeth, first narrow-based, second and third broad-based; right mandible with two marginal teeth, point of first marginal tooth 0.29 mm. from tip of apical

tooth. Postmentum shaped as in figure; not strongly constricted in middle. Antenna with 10 to 11 articles; third longer than fourth, third shorter than fourth in antenna with 11 articles. Pronotum almost as wide as head; anterior margin angular; anterolateral corners narrow; sides rounded; posterolateral margins rounded; posterior margin slightly emarginate. Femur moderately swollen.

TABLE 26
MEASUREMENTS (IN MILLIMETERS) OF EIGHT SOLDIERS OF
Glyptotermes parvoculatus, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.50	1.35-1.50	1.44
Width of head	0.99	0.94-1.05	0.99
Height of head	0.90	0.90-0.92	0.90
Length of left mandible	0.72	0.68-0.73	0.70
Maximum width of postmentum	0.38	0.34-0.38	0.37
Minimum width of postmentum	0.23	0.23-0.24	0.23
Length of postmentum	0.94	0.83-0.94	0.90
Median length of pronotum	0.49	0.45-0.49	0.46
Maximum length of pronotum	0.60	0.53-0.62	0.58
Width of pronotum	0.90	0.79-0.92	0.89
Length of hind tibia	0.60	0.60	0.60

TYPE LOCALITY AND DISTRIBUTION: Northern Range (approximately latitude $10^{\circ} 45' N.$, longitude $61^{\circ} 30' W.$), elevation 1800 feet, Trinidad, the West Indies (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), collected by A. M. Adamson, no. 3117, October 28, 1938; imagoes (paramorphotypes), soldiers (paratypes), collected by A. M. Adamson, no. 89, January 1, 1935. Aripo (latitude $10^{\circ} 43' N.$, longitude $61^{\circ} 15' W.$), elevation 2800 feet, Trinidad, the West Indies, dealates (paramorphotypes), soldiers (paratypes), collected by A. M. Adamson, no. 4017, February 27, 1944. Morne Bleu, elevation 1800 feet, Trinidad, the West Indies, one soldier (paratype), collected by A. M. Adamson, no. 2714, May 22, 1938.

***Glyptotermes rotundifrons*, new species**

IMAGO (FIG. 27): Head, pronotum, and tergites yellowish or brownish; frons lighter; postclypeus about same color as head; antennae and legs brownish yellow; wings smoky brown, contrasting markedly with head and pronotum; wing scale lighter than darker portions of wing. Head sparsely covered with both long and short bristles; pronotum with both

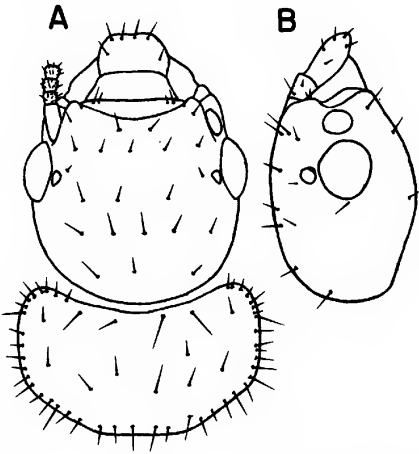


FIG. 27. Imago of *Glyptotermes rotundifrons*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony. Drawn by A. E. Emerson.

long and short bristles along margins and on disc; abdomen and legs moderately pilose. Head oval. Y suture visible but not conspicuous. Eyes shaped as in figure. Ocellus subtriangular, very close (0.02 mm.) to eye. Antenna with 14 to 16 articles; third article variable, subequal to second. Anterior margin of pronotum concave; anterolateral corners rounded; anteriorly sides somewhat rounded, posteriorly sides sloping at an angle

TABLE 27
MEASUREMENTS (IN MILLIMETERS) OF ELEVEN IMAGOS OF
Glyptotermes rotundifrons, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.50-1.65	1.59
Length of head to side base of mandibles	1.20-1.28	1.24
Width of head	1.32-1.41	1.36
Diameter of eye	0.35-0.39	0.37
Eye from lower margin	0.18-0.25	0.21
Length of ocellus	0.12-0.14	0.12
Median length of pronotum	0.71-0.78	0.75
Width of pronotum	1.35-1.41	1.38
Length of hind tibia	1.06-1.18	1.12
Length of forewing from suture	6.96-7.33	7.15
Width of forewing	1.82-2.06	1.90

before joining the straight posterior margin. Hind wing with media branching from radial sector, outside wing scale, at about 0.38 mm. from suture.

COMPARISONS: In *Glyptotermes canellae* (Müller) a circular ocellus touches the eye, and the head and pronotum are slightly smaller. In *G. contracticornis* (Snyder) all measurements are larger, and the posterolateral margins of the pronotum are rounded. *Glyptotermes longipennis*, new species, is larger in all respects. The rest of the known species from the Neotropical Region are smaller than *G. rotundifrons*.

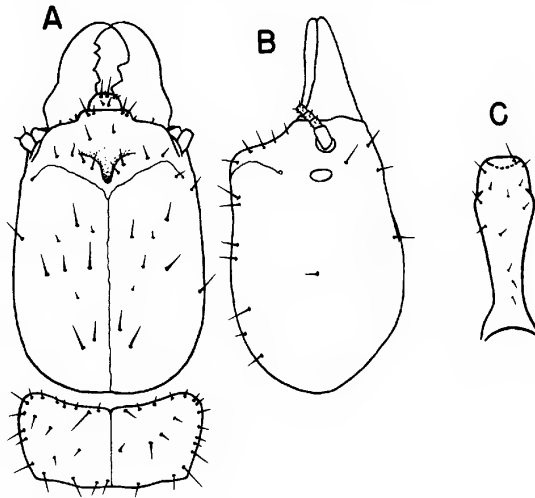


FIG. 28. Soldier of *Glyptotermes rotundifrons*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below. Paratype from type colony. A and B drawn by A. E. Emerson.

SOLDIER (FIG. 28): Head reddish brown, darker in front; mandibles nearly black, somewhat lighter at bases; pronotum brownish, lighter than head; abdomen, legs, and antennae yellowish. Head covered with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc; abdomen and legs heavily pilose. Head stocky; sides slightly converging anteriorly; forehead in profile nearly vertical, middle portion sloping at an angle of about 50 degrees; conspicuously indented in middle, forming two rounded lobes. Y suture visible. Eyes oval. Mandibles stout, with a basal hump at outer bases; left mandible with three marginal teeth; right mandible with two marginal teeth, point of first marginal tooth 0.38 mm. from tip of apical tooth. Postmen-

tum widest at about anterior third, narrowest at posterior third. Antenna with 12 to 13 articles; second article longer than third, third equal to fourth. Anterior margin of pronotum concave, with a notch in middle; sides rounded; posterior margin slightly sinuate on each side and somewhat angular where it joins lateral margins. Femur stout and swollen.

TABLE 28
MEASUREMENTS (IN MILLIMETERS) OF FIFTEEN SOLDIERS OF
Glyptotermes rotundifrons, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	2.40	2.26-2.55	2.35
Width of head	1.80	1.73-1.83	1.78
Height of head	1.58	1.50-1.65	1.56
Length of left mandible	1.20	1.12-1.26	1.22
Maximum width of postmentum	0.60	0.58-0.60	0.59
Minimum width of postmentum	0.30	0.30-0.33	0.31
Length of postmentum	1.58	1.35-1.58	1.48
Median length of pronotum	0.75	0.67-0.77	0.72
Maximum length of pronotum	1.05	0.83-1.05	0.94
Width of pronotum	1.72	1.50-1.72	1.60
Length of hind tibia	0.99	0.99-1.12	1.05

COMPARISONS: *Glyptotermes rotundifrons* differs from all other Neotropical species in its large and stocky head, with knob-like lobes in the forehead; the long and thick mandibles, with their outer margins humped at the bases; the sinuate posterior margin of the pronotum; and the long and strongly constricted postmentum.

TYPE LOCALITY: Barro Colorado Island (latitude 9° 10' N., longitude 79° 51' W.), Panama Canal Zone (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), collected by A. E. Emerson, no. 129, July 16, 1935; soldiers (paratypes), collected by A. E. Emerson, no. 102, June 2, 1935 (same colony as type colony).

***Glyptotermes seeversi*, new species**

IMAGO (FIG. 29): Head, pronotum, and abdomen yellowish brown; frons with round patches on each side; pronotum lighter than head, with a T-shaped marking in center; antennae and legs yellowish; wings smoky brown. Head with a few scattered, erect bristles; pronotum with many bristles along margins and a few on disc. Head nearly as broad as length to side base of mandibles. Y suture faintly visible. Eyes shaped as in

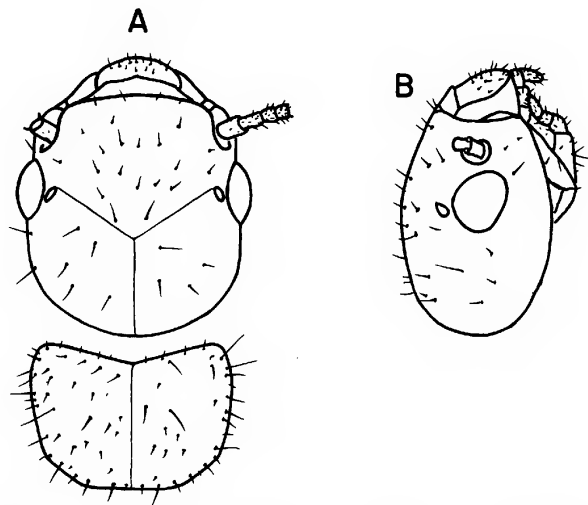


FIG. 29. Imago of *Glyptotermes seeversi*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

figure. Ocellus pear-shaped, very close (0.01 mm.) to eye. Antenna with 13 articles; second article longer than third, third longer than fourth. Pronotum narrower than head; anterior margin angular; sides faintly rounded; posterolateral margins broadly rounded or straight, sloping at an angle before joining the straight posterior margin. Hind wing with media branching from radial sector, outside wing scale, at about 0.90 mm. from suture.

TABLE 29
MEASUREMENTS (IN MILLIMETERS) OF SEVEN IMAGOS OF *Glyptotermes seeversi*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.20-1.28	1.22
Length of head to side base of mandibles	0.98-1.02	0.99
Width of head	1.01-1.05	1.04
Diameter of eye	0.26-0.30	0.29
Eye from lower margin	0.14-0.19	0.17
Length of ocellus	0.10-0.11	0.11
Median length of pronotum	0.50-0.56	0.53
Maximum length of pronotum	0.56-0.64	0.61
Width of pronotum	0.83-0.96	0.88
Length of hind tibia	0.90-0.98	0.96
Length of forewing from suture	5.66-6.22	5.91
Width of forewing	1.65-1.72	1.69

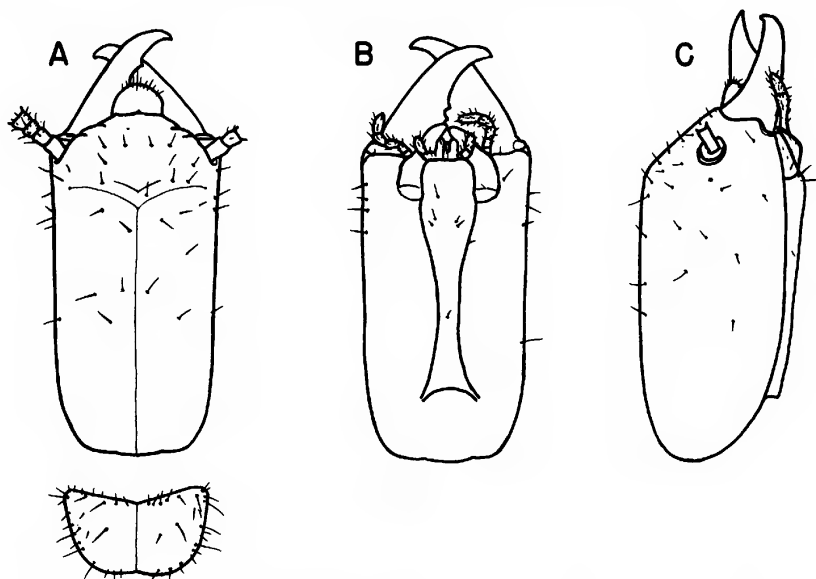


FIG. 30. Holotype soldier of *Glyptotermes seeversi*, new species. A. Head and pronotum from above. B. Head from below. C. Head from side.

COMPARISONS: In *Glyptotermes suturis* Snyder the head and pronotum are broader and longer, the posterior margin of the pronotum is shallowly emarginate, with more rounded sides, and the ocellus touches the eye. In *G. pellucidus* Emerson the head and wings are narrower and shorter, the eyes are larger, and the ocellus touches the eye.

SOLDIER (FIG. 30): Head brown, frons reddish brown; mandibles dark reddish brown; labrum yellowish; pronotum, antennae, and legs light brown. Head with a few scattered bristles; pronotum with both long and short bristles along margins and on disc; labrum with 10 to 11 erect bristles. Head long, narrow posteriorly, broadest anteriorly; frons in middle slightly depressed; in profile sloping at an angle of approximately 45 degrees. Y suture visible as a faint line. Eyes small, faint. Labrum small, sides straight, anterior margin round. Mandibles short and stout, outer margins almost even; left mandible with three very small marginal teeth, which resemble crenulations, first tooth largest; right mandible with two marginal teeth, point of first marginal tooth 0.35 mm. from tip of apical tooth. Postmentum long; from broadest part sides strongly converging posteriorly, running parallel for a short distance, and diverging again. Antenna with 11 to 13 articles; third article shortest, fourth slightly longer than third but shorter than second. Pronotum narrower than head; anterior margin angular; anterolateral corners narrow; posterolateral

margins broadly rounded; posterior margin with a broad indentation in middle.

TABLE 30
MEASUREMENTS (IN MILLIMETERS) OF SOLDIERS OF *Glyptotermes seeversi*, NEW SPECIES

	Holotype	Paratypes		Paratypes	
		Type	Colony	No.	Range
		No.	Range		
Length of head to side base of mandibles	2.02	2	1.88–2.02	5	2.18–2.33
Width of head	1.09	2	1.03–1.09	5	1.15–1.22
Height of head	0.98	2	0.98	5	1.07–1.13
Length of left mandible	0.90	2	0.90	5	0.97
Maximum width of postmentum	0.39	2	0.38–0.39	5	0.38–0.45
Minimum width of postmentum	0.19	2	0.19	5	0.15–0.17
Length of postmentum	1.46	2	1.35–1.46	5	1.58–1.73
Median length of pronotum	0.47	2	0.45–0.47	5	0.49–0.56
Maximum length of pronotum	0.60	2	0.56–0.60	5	0.60–0.70
Width of pronotum	0.92	2	0.83–0.92	5	0.98–1.05
Length of hind tibia	0.83	2	0.83	5	0.87–0.90

COMPARISONS: *Glyptotermes seeversi* differs from all other Neotropical species in its long, narrow, and thin head, which is anteriorly broad.

TYPE LOCALITY: Cordoba (latitude 18° 55' N., longitude 96° 55' W.), Veracruz, Mexico (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratype), nymphs, collected by C. H. Seevers, July 21, 1936; soldiers (paratypes), nymphs, collected by C. H. Seevers, July 22, 1936.

The species is named in honor of Dr. C. H. Seevers, Professor of Zoology, Roosevelt University, Chicago, Illinois.

***Glyptotermes sicki*, new species**

IMAGO (FIG. 31): Head chestnut brown, frons with two light spots on each side and a V-shaped light marking in center; pronotum bright yellow; legs and labrum yellowish; antennae brownish; tergites yellowish brown; wings smoky; wing scale smoky brown. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc; tibia thickly covered with short hairs. Head length to side base of mandibles approximately equal to head width. Y suture faintly visible. Eyes shaped as in figure. Ocellus small, somewhat oval, touching the eye. Antenna with 13 articles; second article longer than

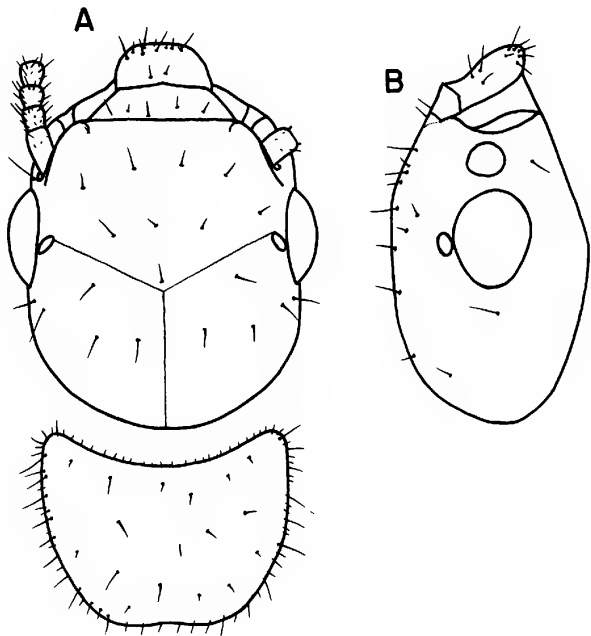


FIG. 31. Dealate imago of *Glyptotermes sicki*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

third, third longer than or equal to fourth. Pronotum slightly narrower than head; anterior margin concave; sides rounded; posterior margin slightly emarginate. Hind wing with media branching from radial sector, outside wing scale, at about 0.53–0.68 mm. from suture.

TABLE 31
MEASUREMENTS (IN MILLIMETERS) OF ELEVEN IMAGOS OF *Glyptotermes sicki*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	0.98–1.05	1.02
Length of head to side base of mandibles	0.83–0.90	0.86
Width of head	0.82–0.90	0.85
Diameter of eye	0.25–0.29	0.27
Eye from lower margin	0.09–0.11	0.10
Length of ocellus	0.07	0.07
Median length of pronotum	0.45–0.53	0.48
Maximum length of pronotum	0.54–0.66	0.60
Width of pronotum	0.71–0.83	0.76
Length of hind tibia	0.64–0.72	0.68
Length of forewing from suture	4.87–4.95	4.89
Width of forewing	1.35–1.50	1.43

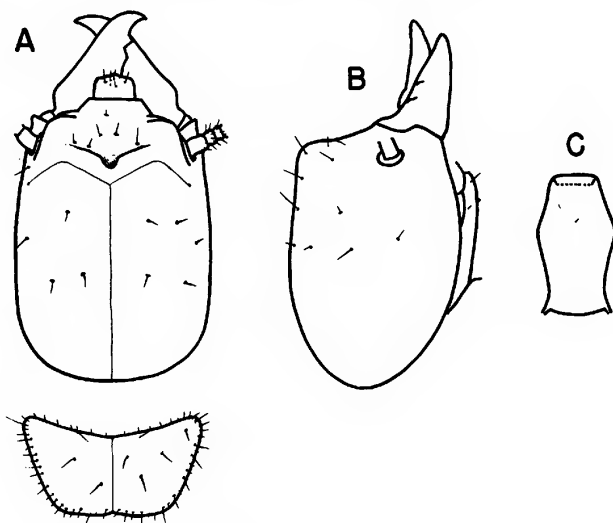


FIG. 32. Holotype soldier of *Glyptotermes sicki*, new species. A. Head and pronotum from above. B. Head from side. C. Postmentum from below.

COMPARISONS: *Glyptotermes angustus* Snyder has a narrower head, narrower and shorter wings and pronotum, and 12 articles in the antenna. *Glyptotermes asperatus* (Snyder) has a narrower head and pronotum, longer tibia, shorter wings, and 12 articles in the antenna. *Glyptotermes adamsoni*, new species, has a lighter-colored head, smaller eyes, larger ocellus, longer and broader wings, a narrower pronotum, and 12 articles in the antenna. *Glyptotermes marlatti* Snyder has a lighter-colored and smaller head and shorter and narrower wings and pronotum. *Glyptotermes perparvus* Emerson has a smaller head, a narrower pronotum, shorter and narrower wings, and 11 to 12 articles in the antenna.

SOLDIER (FIG. 32): Head yellowish brown, frons reddish brown; mandibles dark reddish brown; pronotum light yellow; antennae, legs, and labrum yellowish; tergites whitish. Head with a few scattered, erect, and short bristles; pronotum with both long and short bristles along margins and on disc. Head small and thick (in two paratype colonies from Ilha Grande, soldiers are larger); sides converging anteriorly; forehead in profile nearly vertical, middle portion sloping at an angle of approximately 50 degrees; bilobed, with a deep incision in middle. Mandibles short, with a very slight hump at outer bases; left mandible with three marginal teeth, first tooth narrow-based, second and third broad-based; right mandible with two marginal teeth, point of first marginal tooth 0.21–0.25 mm. from tip of apical tooth. Postmentum

shaped as in figure; slightly constricted in middle; in profile a very small tubercle visible in anterior region. Antenna with 10 articles; third article shortest, fourth shorter than second. Pronotum slightly narrower than head; anterior margin broadly angular; anterolateral corners narrow; sides straight, converging posteriorly; posterior margin with a slight indentation in middle. Femur moderately swollen.

TABLE 32
MEASUREMENTS (IN MILLIMETERS) OF SOLDIERS OF *Glyptotermes sicki*, NEW SPECIES

	Holotype	Paratype Colonies (516,83)		Paratype Colony	
		No.	Range	No.	Range
Length of head to side base of mandibles	1.13	3	1.05-1.13	6	1.38-1.53
Width of head	0.88	3	0.83-0.90	6	1.01-1.08
Height of head	0.81	3	0.77-0.83	6	0.98-1.01
Length of left mandible	0.61	3	0.61	6	0.68
Maximum width of postmentum	0.34	3	0.32-0.34	6	0.38-0.39
Minimum width of postmentum	0.26	3	0.26	6	0.26-0.30
Length of postmentum	0.60	3	0.60-0.67	6	0.75-0.83
Median length of pronotum	0.36	3	0.36-0.38	6	0.45-0.53
Maximum length of pronotum	0.45	3	0.45-0.53	6	0.60
Width of pronotum	0.77	3	0.75-0.79	6	0.98-1.08
Length of hind tibia	0.43	3	0.43-0.46	6	0.68-0.72

COMPARISONS: *Glyptotermes adamsoni*, new species, has more prominent lobes on the forehead and a deeper and broader incision in the middle of the frons, the anterior margin of the labrum evenly rounded, and in the pronotum the anterior margin broadly concave, the anterolateral corners broader, and the posterolateral margins more broadly rounded.

TYPE LOCALITY: Ilha Grande (approximately latitude 22° 59' S.-23° 7' S., longitude 44° 7' W.-44° 26' W.), state of Rio de Janeiro, Brazil (type locality), dealates (morphotype and paramorphotypes), one soldier (holotype), collected by H. Muth and H. Sick, no. 516, October 16, 1944; dealates (paramorphotypes), one soldier (paratype), nymphs, collected by H. Muth and H. Sick, no. 516, October 16, 1944; king, queen (paramorphotypes), one soldier (paratype), collected by H. Muth and H. Sick, October 10, 1944; imagoes (paramorphotypes), nymphs, collected by H. Muth and H. Sick, no. 83, June 26, 1944; soldiers (paratypes), nymphs, collected by H. Muth and H. Sick, October 10, 1944; soldiers (paratypes), collected by H. Muth and H. Sick, October 16 and June 11, 1944.

The species is named in honor of Mr. H. Sick.

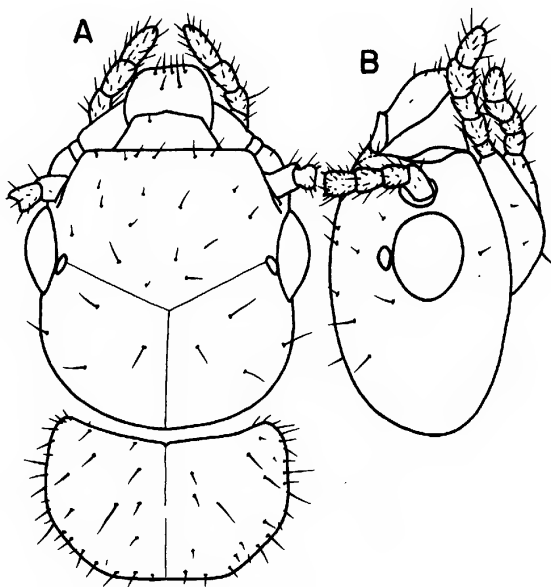


FIG. 33. Imago of *Glyptotermes truncatus*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

***Glyptotermes truncatus*, new species**

IMAGO (FIG. 33): Head rusty brown; pronotum brown, lighter than head, with a T-shaped marking in center; antennae light smoky brown; labrum and legs yellowish brown; tergites rusty brown; wings smoky, wing scales darker. Head and pronotum with a few scattered, erect bristles. Y suture faintly visible. Eye shaped as in figure. Ocellus oblique, touching the eye. Antenna with 11 to 12 articles; in antenna with 11 articles, third article longer than fourth; in antenna with 12 articles, third article equal to fourth. Pronotum narrower than head; anterior margin concave; sides rounded; posterior margin straight. Hind wing with media branching from radial sector, outside wing scale, at about 0.75 mm. from suture.

COMPARISONS: *Glyptotermes truncatus* closely resembles *G. asperatus* (Snyder) but can be distinguished from it by its dark color, shorter tibia, shorter and narrower pronotum, and slightly longer wings. *Glyptotermes angustus* Snyder has a larger ocellus and a broader and shorter pronotum. *Glyptotermes perparvus* Emerson has smaller eyes and ocelli and a broader and shorter pronotum.

TABLE 33
MEASUREMENTS (IN MILLIMETERS) OF EIGHT IMAGOS OF *Glyptotermes truncatus*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	0.98-1.05	0.98
Length of head to side base of mandibles	0.75-0.83	0.76
Width of head	0.77-0.83	0.79
Diameter of eye	0.25-0.28	0.26
Eye from lower margin	0.09-0.11	0.11
Length of ocellus	0.07-0.09	0.08
Median length of pronotum	0.39-0.41	0.40
Width of pronotum	0.60-0.68	0.65
Length of hind tibia	0.64	0.64
Length of forewing from suture	4.10-4.53	4.33
Width of forewing	1.09-1.23	1.15

SOLDIER (FIG. 34): Head brown, dark reddish brown to blackish anteriorly; mandibles fuscous; pronotum reddish brown; antennae, legs, and tergites light yellowish brown. Head with a few scattered, erect bristles; pronotum with a few long and short bristles along margins and on disc; labrum with two bristles at tip. Head short, thick, and truncate; sides slightly converging in front; frontal region vertical, with a depression on each side; forehead bilobed, with a broad and deep incision in middle; lobes broadly rounded and margins rough; a small prominence below antennal socket. Eyes small, oval. Mandibles short, broad at bases; left mandible with three small marginal teeth; right mandible with two

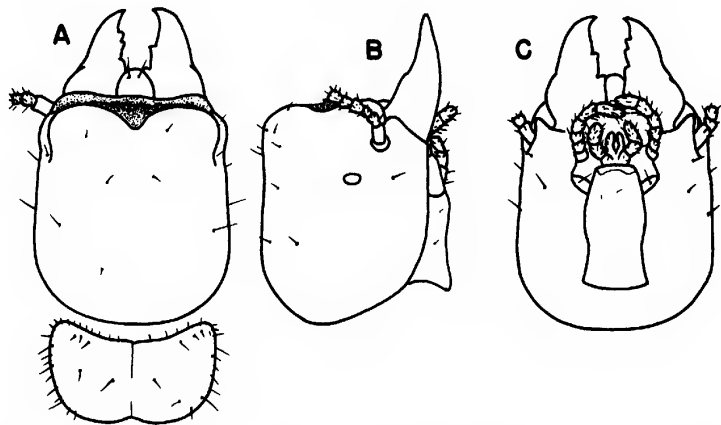


FIG. 34. Soldier of *Glyptotermes truncatus*, new species. A. Head and pronotum from above. B. Head from side. C. Head from below. Paratype from type colony.

marginal teeth, point of first marginal tooth 0.21 mm. from tip of apical tooth. Postmentum shaped as in figure. Antenna with 10 to 11 articles; third longer or equal to fourth. Pronotum narrower than head; anterior margin concave, with a slight notch in middle; posterolateral margins rounded; posterior margin with a deep indentation in middle. Femur slightly swollen.

TABLE 34
MEASUREMENTS (IN MILLIMETERS) OF FOUR SOLDIERS OF *Glyptotermes truncatus*, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.13	1.05–1.13	1.09
Width of head	0.98	0.91–0.98	0.95
Height of head	0.90	0.90–0.91	0.90
Length of left mandible	0.60	0.60	0.60
Maximum width of postmentum	0.36	0.34–0.36	0.36
Minimum width of postmentum	0.28	0.26–0.28	0.27
Length of postmentum	0.56	0.56–0.59	0.58
Median length of pronotum	0.44	0.41–0.45	0.43
Maximum length of pronotum	0.53	0.53–0.54	0.53
Width of pronotum	0.86	0.86–0.90	0.87
Length of hind tibia	0.57	0.57	0.57

COMPARISONS: *Glyptotermes truncatus* closely resembles *G. asperatus* (Snyder), but differs from it as follows: the head is shorter, with the lobes more broadly rounded; the frontal slope has a depression on each side, below the lobes; the incision in the middle of the forehead is narrower, and the postmentum is shorter.

TYPE LOCALITY: Near Porcecito (approximately latitude 6°–8° N., longitude 75°–76° 45' W.), Rio Porce, elevation 3300 feet, Colombia (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratypes), collected by N. A. Weber, no. 973, August 18, 1938, from a small stump.

***Glyptotermes tuberifer*, new species**

Glyptotermes sp. ADAMSON, 1949, pp. 3, 5 (locality).

IMAGO (FIG. 35): Head reddish brown, lighter anteriorly; pronotum brown, lighter than head, with a T-shaped marking in center; antennae brownish; labrum, legs yellowish; wings smoky, wing scale darker. Head moderately covered with bristles; pronotum with both long and short bristles along margins and on disc. Head posterior to eyes semicircular.

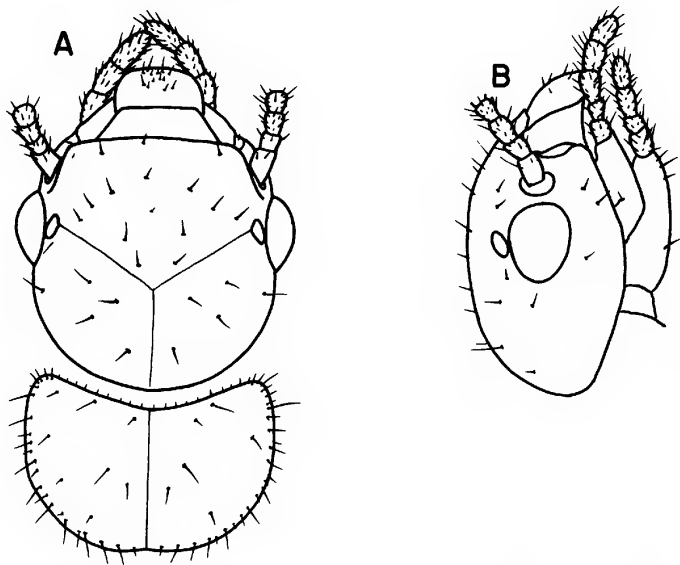


FIG. 35. Imago of *Glyptotermes tuberifer*, new species. A. Head and pronotum from above. B. Head from side. Paramorphotype from type colony.

Y suture conspicuous. Eyes moderately large, shaped as in figure. Ocellus oblique, touching the eye. Antenna with 12 articles; third article longer than second or fourth. Anterior margin of pronotum concave; sides rounded; posterior margin slightly emarginate. Hind wing with media

TABLE 35
MEASUREMENTS (IN MILLIMETERS) OF FOUR IMAGOS OF *Glyptotermes tuberifer*, NEW SPECIES

	Range	Mean
Length of head to tip of labrum	1.13-1.20	1.15
Length of head to side base of mandibles	0.90-0.98	0.91
Width of head	0.98	0.98
Diameter of eye	0.30	0.30
Eye from lower margin	0.13-0.14	0.13
Length of ocellus	0.11-0.13	0.12
Median length of pronotum	0.49-0.53	0.51
Maximum length of pronotum	0.60	0.60
Width of pronotum	0.87-0.90	0.89
Length of hind tibia	0.75	0.75
Length of forewing from suture	5.17-5.40	5.27
Width of forewing	1.35	1.35

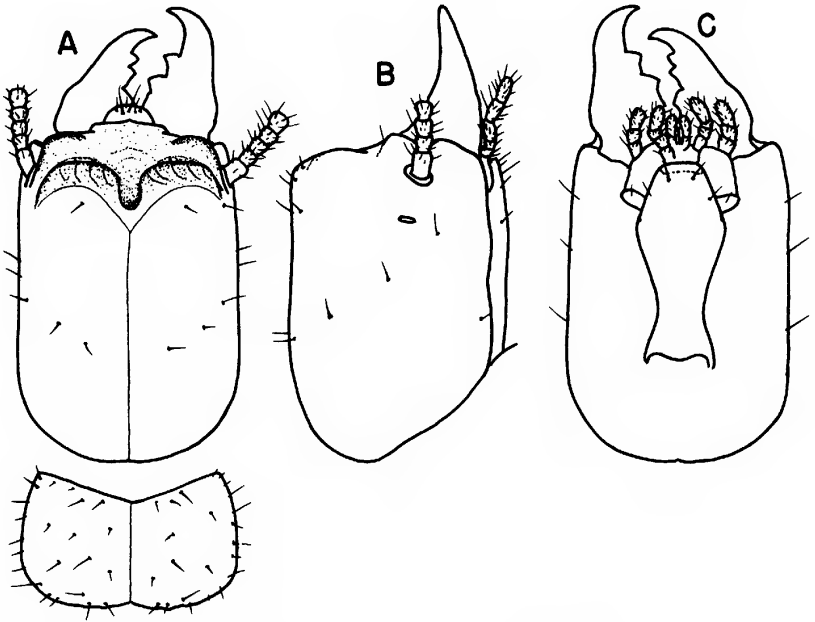


FIG. 36. Soldier of *Glyptotermes tuberifer*, new species. A. Head and pronotum from above. B. Head from side. C. Head from below. Paratype from type colony.

branching from radial sector, outside wing scale, at about 0.90 mm. from suture.

COMPARISONS: *Glyptotermes adamsoni*, new species, differs from *G. tuberifer* in having a narrower head, longer pronotum, smaller eyes and ocelli, and narrower forewings.

SOLDIER (FIG. 36): Head chestnut brown, reddish brown anteriorly, frons blackish; mandibles shiny and blackish; pronotum brown; antennae, legs, and tergites yellowish. Head with a few scattered, erect bristles; pronotum with both long and short bristles along margins and on disc. Head long and thick; sides somewhat parallel; forehead in front vertical, distinctly bilobed, with a deep incision in middle; margin of lobes rough; a faint ridge above and in front of antennal socket. Eyes small. Mandibles short and stout, outer margins with a faint basal hump; left mandible with three marginal teeth, first tooth narrow-based, second and third broad-based; right mandible with two marginal teeth, point of first marginal tooth 0.25 mm. from tip of apical tooth. Postmentum shaped as in figure; sides from anterior third converging markedly in front. Antenna with 10 to 11 articles; third longer or shorter than fourth. Pronotum

nearly as broad as head; anterior margin angular and raised; sides rounded; posterior margin wavy, distinctly indented in middle. Femur swollen.

TABLE 36
MEASUREMENTS (IN MILLIMETERS) OF TWO SOLDIERS OF *Glyptotermes tuberifer*, NEW SPECIES

	Holotype	Range	Mean
Length of head to side base of mandibles	1.46	1.46–1.50	1.48
Width of head	1.07	1.07	1.07
Height of head	0.99	0.98–1.01	0.98
Length of left mandible	0.68	0.68	0.68
Maximum width of postmentum	0.40	0.39–0.41	0.39
Minimum width of postmentum	0.24	0.24–0.26	0.25
Length of postmentum	0.87	0.87–0.90	0.88
Median length of pronotum	0.49	0.49	0.49
Maximum length of pronotum	0.60	0.60–0.64	0.62
Width of pronotum	0.98	0.98–1.05	1.01
Length of hind tibia	0.60	0.60	0.60

COMPARISONS: *Glyptotermes asperatus* (Snyder) is smaller in all respects. *Glyptotermes adamsoni*, new species, differs from *G. tuberifer* in the following respects: it has a smaller head, the incision in the middle of the forehead is narrower and less deep, the lobes on the forehead are not so prominent, the pronotum is narrower, the anterior margin of the pronotum is not raised, and the posterior margin is straight or very faintly emarginate.

TYPE LOCALITY: Sandy Bay (latitude 13° 27' N., longitude 61° 08' W.), St. Vincent Island, the West Indies (type locality), imagoes (morphotype and paramorphotypes), soldiers (holotype and paratype), collected by A. M. Adamson, no. 2866, June 24, 1938.

BIBLIOGRAPHY

ADAMSON, A. M.
 1940. A second report on the termites of Trinidad, British West Indies. *Trop. Agr.*, vol. 17, no. 1, pp. 12–15.
 1949. Notes on the termite fauna of the Lesser Antilles. *Ibid.*, vol. 25, nos. 1–12, pp. 53–55.
 BUGNION, E., AND N. POPOFF
 1910. Les *Calotermes* de Ceylon. *Mém. Soc. Zool. France*, vol. 23, no. 9, pp. 124–144.
 COATON, W. G. H.
 1955. New Isoptera from the Belgian Congo (with description of some named species). *Jour. Ent. Soc. South Africa*, vol. 18, no. 2, pp. 109–136.

EMERSON, A. E.

1925. The termites of Kartabo, Bartica District, British Guiana. *Zoologica*, vol. 6, no. 4, pp. 291-459.
1945. The neotropical genus *Syntermes* (Isoptera: Termitidae). *Bull. Amer. Mus. Nat. Hist.*, vol. 83, art. 7, pp. 427-472.
1952. The neotropical genera *Procornitermes* and *Cornitermes* (Isoptera, Termitidae). *Ibid.*, vol. 99, art. 8, pp. 479-539.
1955. Geographical origins and dispersions of termite genera. *Fieldiana, Zool.*, vol. 37, pp. 465-521.

FROGGATT, W. W.

1896. Australian Termitidae. Part II. *Proc. Linnean Soc. New South Wales*, vol. 21, pt. 2, pp. 510-552.

HAGEN, N. A.

1858. Monographie der Termiten. Part 2. *Linnaean Ent.*, vol. 12, pp. 1-342.

HAVILAND, G. D.

1898. Observations on termites: with descriptions of new species. *Jour. Linnean Soc. London*, vol. 26, pp. 358-442.

HILL, G. F.

- 1926a. Termites (Isoptera) from South Sea and Torres Strait islands. *Proc. Roy. Soc. Victoria*, new ser., vol. 39, pt. 1, art. 4, pp. 20-24.
1926b. New termites from Samoan Islands. *Entomologist*, vol. 59, no. 762, pp. 296-300.
1942. Termites (Isoptera) from the Australian region. Melbourne, Australian Council for Scientific and Industrial Research, pp. 1-479.

HOLMGREN, N.

- 1911a. Termitenstudien. 2. Systematik der Termiten. Die Familien Mastotermitidae, Protermitidae and Mesotermitidae. *K. Svenska Vetensk. Akad. Handl.*, vol. 46, no. 6, pp. 1-88.
1911b. Ceylon-Termiten. In Escherich, K., *Termitenleben auf Ceylon*. Jena, pp. 185-212.
1913. Termitenstudien. 4. Versuch einer systematischen Monographie der Termiten der orientalischen Region. *K. Svenska Vetensk. Akad. Handl.*, vol. 50, no. 2, pp. 1-276.

KALSHOVEN, L. G. E.

1960. Data on the occurrence of *Glyptotermes* and *Neotermes* species in Java and Sumatra. *Ent. Ber.*, vol. 20, pp. 34-40.

KEMNER, N. A.

1931. Die Termitenfauna von Amboina. *Lunds Univ. Årsskr.*, new ser., Avd. 2, vol. 27, no. 13; *Fysiogr. Sällsk. Handl.*, new ser., vol. 42, no. 13, pp. 1-53.
1932. Neue Termiten aus der orientalischen Region I-II. *Ent. Tidskr.*, vol. 53, nos. 2-3, pp. 133-155.
1934. Systematische und biologische Studien über die Termiten Javas und Celebes. *K. Svenska Vetensk. Akad. Handl.*, ser. 3, vol. 13, no. 4, pp. 1-241.

KIRBY, H.

1941. Devescovinid flagellates of termites. 1. The genus *Devescovina*. *Univ. California Publ. Zool.*, vol. 45, no. 1, pp. 1-92.
1942a. Devescovinid flagellates of termites. II. The genera *Caduceia* and *Macro-*

- trichomonas*. *Ibid.*, vol. 45, no. 2, pp. 93–166.
- 1942b. Devescovinid flagellates of termites. III. The genera *Foaina* and *Parafoenia*. *Ibid.*, vol. 45, no. 3, pp. 167–246.
1944. The structural characteristics and nuclear parasites of some species of *Trichonympha* in termites. *Ibid.*, vol. 49, no. 8, pp. 185–282.
1945. Devescovinid flagellates of termites. IV. The genera *Metadevescovina* and *Pseudodevescovina*. *Ibid.*, vol. 45, no. 4, pp. 247–318.
- KRISHNA, K.
1961. A generic revision and phylogenetic study of the family Kalotermitidae (Isoptera). *Bull. Amer. Mus. Nat. Hist.*, vol. 122, art. 4, pp. 303–408.
- MÜLLER, F.
1873. Beiträge zur Kenntniss der Termiten. I–II. *Jenaische Zeitschr. Med. Naturwiss.*, vol. 7, no. 3, pp. 333–358; III, *ibid.*, vol. 7, no. 4, pp. 451–463.
- SILVESTRI, F.
1912. Termiti raccolte da L. Fea alla Guinea Portoghese e alla isole S. Thomè, Annobon, Principe e Fernando Poo. *Ann. Mus. Civ. Stor. Nat. Genova*, ser. 3, vol. 5, pp. 211–255.
- SJÖSTEDT, Y.
1907. Über eine Termitensammlung aus Kongo. *Ent. Tidskr. Agr.*, vol. 28, no. 4, pp. 233–250.
1926. Revision der Termiten Afrikas. 3. Monographie. K. Svenska Vetensk. Akad. Handl., ser. 3, vol. 3, no. 1, pp. 1–419.
- SNYDER, T. E.
1924. Descriptions of new species and hitherto unknown castes of termites from America and Hawaii. *Proc. U. S. Natl. Mus.*, vol. 64, art. 6, pp. 1–40.
- 1925a. New termites and hitherto unknown castes from the Canal Zone, Panama. *Jour. Agr. Res.*, vol. 29, no. 4, pp. 179–193.
- 1925b. New American termites, including a new subgenus. *Jour. Washington Acad. Sci.*, vol. 15, no. 7, pp. 152–162.
1926. New termites from Guatemala, Costa Rica and Colombia. *Ibid.*, vol. 16, no. 1, pp. 18–28.
1929. New termites from the Antilles and Middle America. *Proc. Ent. Soc. Washington*, vol. 31, no. 4, pp. 79–87.
1934. Two new termites from Costa Rica. *Proc. Biol. Soc. Washington*, vol. 47, pp. 95–98.
1949. Catalog of termites (Isoptera) of the world. *Smithsonian Misc. Coll.*, vol. 112, pp. 1–490.
- WILKINSON, W.
1954. Three new species of Kalotermitidae (Isoptera) from East Africa. *Proc. Roy. Ent. Soc. London*, ser. B, vol. 23, pts. 5–6, pp. 75–82.
1959. Four new species of Kalotermitidae from East Africa (Isoptera). *Ibid.*, ser. B, vol. 28, pts. 5–6, pp. 61–72.

